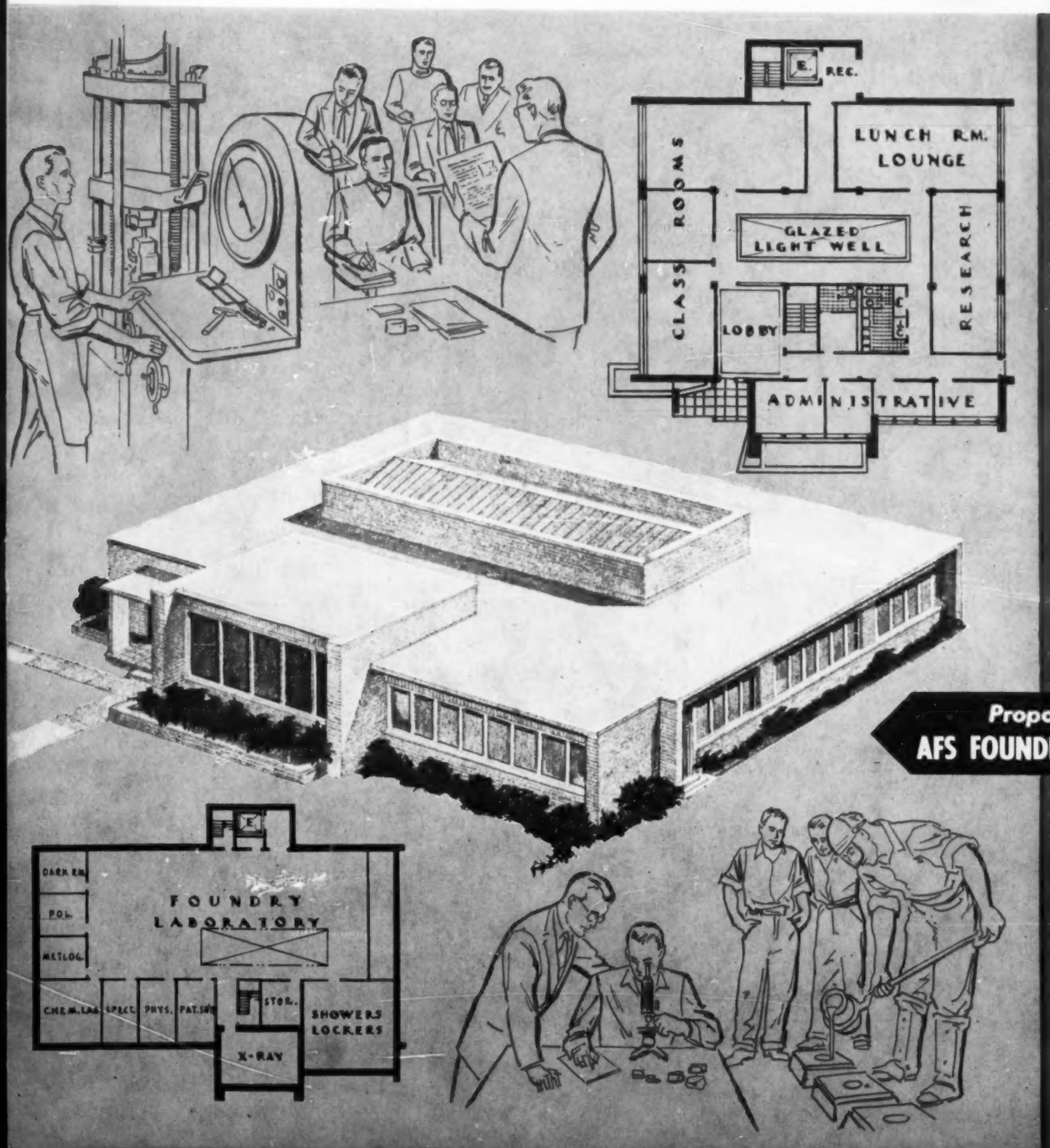
JANUARY, 1957

modern castings



Proposed Design for
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future meetings and exhibits

JANUARY

18 . . Malleable Founders' Society, *Hotel Cleveland, Cleveland. Semi-Annual Meeting.*

28-31 . . Plant Maintenance & Engineering Show, *Public Auditorium, Cleveland.*

FEBRUARY

4-8 . . American Society for Testing Materials, *Benjamin Franklin Hotel, Philadelphia, Committee Week and Spring Meeting.*

7-8 . . Malleable Founders' Society, *Wade Park Manor, Cleveland. Second Technical and Operating Conference.*

14-15 . . Wisconsin Regional Conference, *Hotel Schroeder, Milwaukee. Sponsored by the Wisconsin Chapter and the University of Wisconsin Student Chapter of the American Foundryman's Society.*

21-22 . . Southeastern Regional Foundry Conference, *Dinkler-Tutwiler Hotel, Birmingham, Ala. Sponsored by the Birmingham and Tennessee Chapters and the University of Alabama Student Chapter of the American Foundrymen's Society.*

MARCH

11-15 . . Nuclear Congress, *Convention Hall, Philadelphia.*

13-14 . . Foundry Educational Foundation, *Hotel Cleveland, Cleveland. College-Industry Conference.*

15-16 . . California Regional Foundry Conference, *Claremont Hotel, Berkeley, Calif. Sponsored by the Northern California and Southern California Chapters of the American Foundrymen's Society.*

18-19 . . Steel Founders' Society of America, *Drake Hotel, Chicago. Annual Meeting.*

25-27 . . American Society of Tool Engineers, *Shamrock Hilton Hotel, Houston, Tex. Silver Anniversary Technical Meeting and Convention.*

25-29 . . American Society for Metals, *Pan-Pacific Auditorium, Los Angeles. Tenth Western Metal Exposition and Congress.*

APRIL

9-11 . . American Welding Society, *Convention Hall, Philadelphia, Welding Show.*

10-11 . . Malleable Founders' Society, *Edgewater Beach Hotel, Chicago. Market Development Conference.*

12-13 . . East Coast Regional Foundry Conference, *Benjamin Franklin Hotel, Philadelphia. Sponsored by the Philadelphia, Metropolitan and Chesapeake Chapters of the American Foundrymen's Society.*

29-May 3 . . Materials Handling Exposition, *Convention Hall, Philadelphia.*

MAY

6-10 . . American Foundrymen's Society, *Cincinnati. The 1st Engineered Castings Show Combined with The 61st Castings Congress.*

JUNE

13-14 . . Malleable Founders' Society, *The Broadmoor, Colorado Springs, Colo. Annual Meeting.*

16-21 . . American Society for Testing Materials, *Chalfonte-Haddon Hall, Atlantic City, N. J. Annual Meeting.*

20-22 . . Penn State Regional Foundry Conference, *Penn State University, State University, Pa. Sponsored by the Rochester, Pittsburgh, Metropolitan, Eastern New York, Western New York, Northwestern Pennsylvania, Central New York, Chesapeake and Philadelphia Chapters and the Penn State University Student Chapter of the American Foundrymen's Society and the Reading Foundrymen's Assn. and Conestoga Foundrymen's Assn.*

23-25 . . Alloy Casting Institute. *The Homestead, Hot Springs, Va. Annual Meeting.*

NOVEMBER

2-8 . . American Society for Metals, Chicago. *2nd World Metallurgical Congress, to be held simultaneously with the 39th National Metal Exposition and Congress.*

Chicago Foundrymen Elect

John R. Shumway, C. W. Shumway & Sons, Batavia, Ill., was reelected president of the Chicago Foundrymen's Association at its annual meeting. Other officers are: vice-president, H. C. Swanson, Arrow Pattern & Foundry Co., Chicago; secretary-treasurer, R. H. Lehmpuhl, Sheffield Foundry Co., Chicago; directors, B. J. Chelini, Jr., Troy Brass & Aluminum Foundry, Chicago and H. J. Leddy, McDonough St. Foundry Div. Infilco, Inc., Joliet, Ill.

Wisconsin Regional Set for Feb. 14-15

■ Improving foundry operations through planned and progressive research, engineering and training will be the theme of the 20th Annual Wisconsin Regional Foundry Conference. The meeting will be held Feb. 14-15 at the Hotel Schroeder, Milwaukee and sponsored by the Wisconsin Chapter of the American Foundrymen's Society and the University of Wisconsin.

Conference president is Prof. G. J. Barker, University of Wisconsin; conference chairman is N. N. Amrhein,

Norman N. Amrhein

Federal Malleable Co., West Allis, Wis.; and co-chairmen are L. J. Woehlke, Grede Foundries, Inc., Milwaukee and Prof. E. R. Shorey, University of Wisconsin. Program chairman is L. J. Andres, Lawran Foundry Co., Milwaukee and ticket chairman is L. S. Krueger, Pelton Steel Castings Co., Milwaukee.

Simultaneous technical sessions will be held both days, admission to the sectional technical meetings will be by badge only.

THURSDAY, FEB. 14

10:00 am . . WELCOMING ADDRESS
"Engineering, Education and Industry," Kurt F. Wendt, Dean, College of Engineering, University of Wisconsin.
"The American Foundrymen's Society's Place in The Casting Industry," Frank W. Shipley, AFS president.
"Report From Our National Office," Wm. W. Maloney, AFS general manager.

10:50 am . . *"Dust and Fume Control,"* Harry E. Gravlin, Claude B. Schneible Co.

12:00 . . . . LUNCHEON
"Communist Aggression in Poland," Chas. J. Kersten, attorney, Milwaukee.

Continued on page 5

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vol. 31, no. 1

modern castings

in this issue

SECTION

regular departments

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On The Management Side

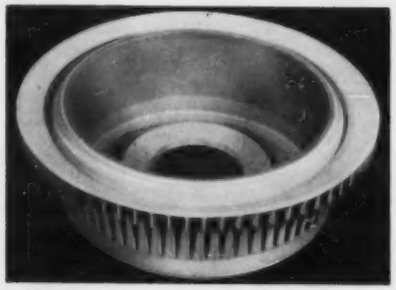
■ **Speaking of Stockpiling.** You may be unaware of the extensive Federal barter program in which surpluses such as corn and wheat are swapped for strategic materials such as industrial diamonds and chromium. In the barter program, agricultural commodities, owned by Commodity Credit Corporation, are exchanged on an equivalent basis for strategic materials held by friendly countries. In operation since 1950, barter contracts valued at over $315 million were negotiated in fiscal 1956. The agricultural commodities exported were wheat, cotton, grain sorghums, barley, corn, oats, and rye. In return, the U.S. Department of Agriculture received such valuable industrial raw materials as antimony, cadmium, ferrochromium-silicon, manganese, ferromonganese, manganese ore, palladium, zinc, lead, rare earths, chromium, cobalt, bismuth, beryllium-copper, industrial diamonds, fluorspar, asbestos, bauxite, chromite, graphite, mica, silicon carbide, talc, and abrasive aluminum oxide. Practically all of these materials are used in the foundry industry. Once imported the materials are transferred to the stockpile program under the jurisdiction of the Office of Defense Mobilization. One of the big advantages of this program lies in the exchange of perishable commodities for non-perishable materials with limited domestic supply.

■ **What's the latest** on the nickel situation? According to the Office of Defense Mobilization nearly eighty million pounds of nickel were diverted from the national stockpile to ease the shortage in 1956 and no nickel at all will go into the stockpile during the first quarter of 1957. C. E. Wilson, Secretary of Defense, states that about one-third of all the nickel consumed goes into direct military and atomic energy uses. All three military departments have told their *designers* to seek out ways to replace high-nickel stainless steels in their equipment with the new manganese-type or the nickel-free stainless steels, or with aluminum, or plastics, or other non-nickel materials. Secretary Wilson "appeals to private industry to cooperate with the Department of Defense by looking for places to save nickel in equipment outside military design control. If you in industry are resourceful in conserving nickel while producing soundly engineered products acceptable to the public it will prove that in this country we can take practical measures to use materials more effectively, without dictation or regulation." So let's heed this advice and not blindly build our metallurgical future on a material with no domestic supply other than an imported stockpile.

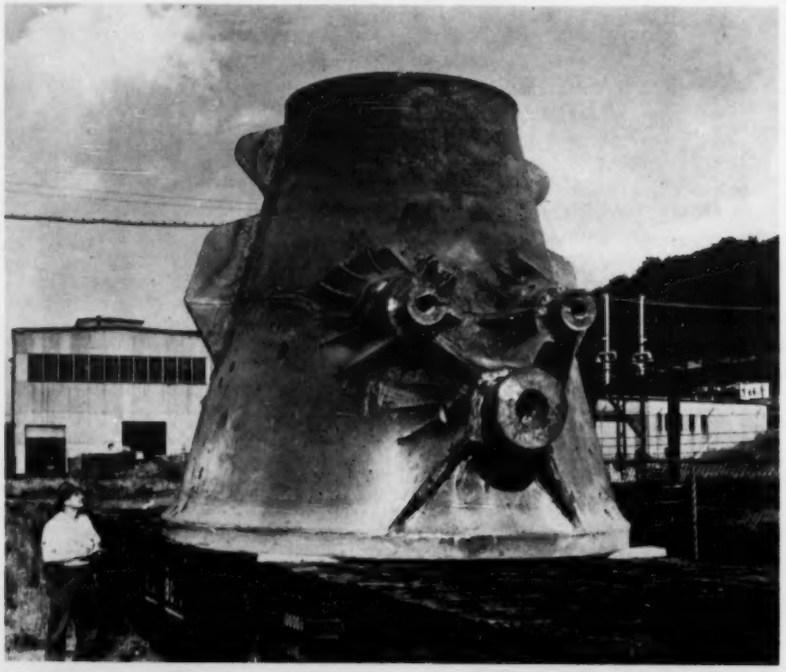
■ **Ups and Downs . . .** Aluminum productive capacity may have temporarily gone ahead of demand, according to I. W. Wilson, President of Aluminum Company of America, and the industry is embarking on an intensive merchandising program to expand uses . . . Accentuating this situation is the decision of the government to free 400 million pounds of aluminum for industry use in the first half of 1957 because it has met minimum stockpiling objectives.

modern castings album

INTERNATIONAL NICKLE COMPANY PHOTOS



Nickel alloy cast iron liners in the brake drums of 240-horsepower Mercedes-Benz sports cars must bring the cars to a stop from speeds as high as 170 mph. In such a stop, the heat developed in each brake drum is almost enough to melt a pound of iron. To withstand such violent temperature changes, the liners of the brake drums are made of 1 per cent nickel alloy iron. Ferrous liners are bonded to cast aluminum drums by the German manufacturer, Karl Schmidt Works, sub-licensee of Al-Fin Division, Fairchild Engine & Airplane Corp., Hagerstown, Md.



Giant, one-piece slag pot represents metallurgical achievement in metal casting at Blaw-Knox Co., Pittsburgh. E. F. Kogline, shown making a final check before shipment, reports that the pot's flat bottom and trunnions are integral parts of the 47,000 lb casting.

Turbine runner for Garrison Dam on Missouri River is one of five of the heaviest and largest ever cast in one piece. Each is 223½ in. in diameter and weighs 150,000 lb. General Steel Casting Co., Eddystone, Pa., cast these runners for Baldwin-Lima-Hamilton turbines.

Continued from page 2

2:15 pm.. *"Can We Make Perfect Castings?"* Jack B. Caine, foundry consultant, Wyoming, Ohio.
"Nodular Iron As Used At Allis-Chalmers," W. Edens, Allis-Chalmers Mfg. Co.
"Pouring Effect On Scrap," C. Drury, Central Foundry Div., General Motors Corp.
"Cleaning Room Problems and Methods Used in The Cleaning Room," Robert Orth, Wheelabrator Corp.
"Cast to Size Cast Iron Patterns," John E. Stock, John Deere Co.

4:00 pm.. *"Spectrographic Analysis,"* L. O. Eikrem, Baird & Associates.
"Magnetic Particle Inspection As It Applies To Gray Iron Castings," Arthur Lindgren, Magna-Flux Corp.
"Gating and Risering," Robert Schauss, Werner G. Smith, Inc.
"New and Special Alloys In The Foundry, Gating and Risering Problems They Present," Dr. George A. Halliwell, H. Kramer & Co.
"Pattern Research," David Kindt, Kindt-Collins Co.

6:30 pm.. CONFERENCE BANQUET
"The World of Tomorrow," Dr. Ralph E. Lapp, Nuclear Science Service.

FRIDAY, FEBRUARY 15

10:00 am.. *"Air Placement of Refractories,"* Howard G. Hart, Harbison-Walker Refractories Co.
"Water Cooled Cupola," R. J. Alyward, Neenah Foundry Co.
"Shell Cores," Harry Weaver, Brillion Iron Works, Inc.
"Budgeting For Profit," Urban F. Von Rosen, Non-Ferrous Founders' Society.
"Mass Plastic Pattern Pouring," William Weaver, Modern Pattern & Plastic Co.

12:00 ..... LUNCHEON
"How to Keep Your Foot Out of Your Mouth," Edward McFaul.

2:30 pm.. *"Sodium Hydride and Other Salt Bath Descaling of Steel Castings,"* A. F. Holden, A. F. Holden Co.
"Quality Control," K. MacKay Smith, quality control consultant.
"Hot Cracks," Richard Heine, University of Wisconsin.
"Sand Preparation and Handling For Small Foundries," R. L. McIlvaine, National Engineering Co.
"Pattern Equipment Necessary for Shell Molding," John Nieman, Shell Process, Inc.

products and processes

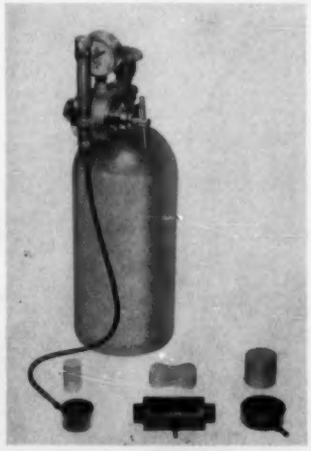
CO_2 core binders, Adcosil, available in three grades for ferrous, non-ferrous and one for super collapsibility. All grades may be supplied with color indicator which remains in core until properly cured. *Archer-Daniels-Midland Co.*

CIRCLE NO. 1, PAGE 7-8

Furnaces for pilot-plant operations are designed to fill gap between laboratory and production. Six units are offered, atmosphere box furnace, box furnace, 3 kw high frequency induction furnace, horizontal tube furnace, vertical tube furnace and high temperature pot furnace. *Lindberg Engineering Co.*

CIRCLE NO. 2, PAGE 7-8

CO_2 laboratory test equipment for evaluating binders, sand mixtures, gas curing rates and gas volumes in terms of sand properties, weighs 10 lbs gross. Accessory consists of pressure reducer and flow meter, gassing fixtures for standard 2 x 2 in. test specimen, the 1-1/8 x 2 in. test specimen for elevated temperature testing and the standard tensile strength specimen. Split specimen tubes are recommended for both cylindrical specimens. Test specimens are formed and tested with standard equipment so that properties of CO_2 process sand mixtures can be readily compared with other types of sand mixtures. *Harry W. Dietert Co.*



CIRCLE NO. 3, PAGE 7-8

Sand conditioner offers magnetic separation with cleaning capacity of 45 tons hourly. Used where sand conditioning is required directly on floor following shakeout. Available in portable or stationary models, designed for bucket loading by front end loader. *Royer Foundry & Machine Co.*

CIRCLE NO. 4, PAGE 7-8

High strength aluminum bronze alloy contains 12 per cent manganese. Essentially a two-phase alloy, it is said to possess higher yield strength, greater toughness and longer fatigue life than any known alloy of its kind. Developed in England by J. Stone & Co. it is produced in the U. S. by American Brake Shoe Co. and Ampco Metal, Inc. *American Brake Shoe Co.*

CIRCLE NO. 5, PAGE 7-8

Corrosion-protective oil offers three-way safeguard, a moisture and vapor-resisting barrier against corrosion, water displacing properties and fingerprint removal. Designed for protecting castings, dies, tools and machined and polished parts. Used after water cooling or testing it is said to eliminate spotting. May be applied by brushing, wiping, dipping or spraying. *Octagon Process, Inc.*

CIRCLE NO. 6, PAGE 7-8

Link-type hinge alignment device for grab buckets eliminates jamming and breakage by non-crushable materials. Device has more bearing surface than

gear-tooth arrangements and is entirely enclosed. Alloyed steel has high tensile strength and is unaffected by high heats encountered in slag removal. *Mead-Morrison Div. McKiernan-Terry Corp.*

CIRCLE NO. 7, PAGE 7-8

Shell process installed by Allied Chain Link Fence Co. Houston, Tex. reduced manufacturing costs. Big savings were realized through reduced machining. Molds using phenolic resins are prepared in advance and stored. Allied produces 60 different castings with 6,000 lbs of metal poured daily. *Bakelite Co. Div. Union Carbide & Carbon Corp.*

CIRCLE NO. 8, PAGE 7-8

Integrated instrumentation system installed by Atlas Steels Ltd. Welland Ontario, rapidly records surface temperatures on four sides of a moving slab or billet allowing for a continuous check on uniformity. Operators depend almost entirely on recorders and controls during production. Recorders are centrally mounted on a panel. Basic instrumentation provides measurement of molten metal temperatures in ladle, control of ladle tilt, regulation of machine speed to maintain constant level in mold, measurement of cooling water, measurement of slab surface temperature and measurement of machine speed. *Leeds and Northrup Co.*

CIRCLE NO. 9, PAGE 7-8

Scales built into materials handling crane at Channel Master Corp., Ellenville, N. Y. has cut weighing time by 40 per cent. The crane scales are installed between the crane boom and load and the cab is equipped with a weight meter so that inventory

control records are taken while the materials are moved. *Baldwin-Lima Hamilton Corp.*

CIRCLE NO. 10, PAGE 7-8

Adjustable safety locking device helps lock dockboards in position between

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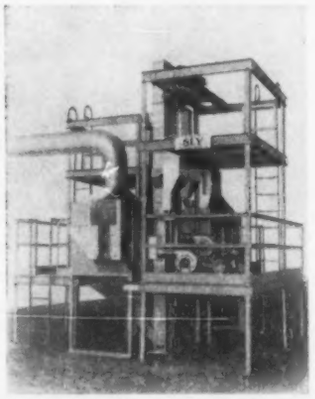
dock and rail car or dock and truck. Easily positioned with two-way locking action, said to resist vibration. *Magnesium Co. of America.*

CIRCLE NO. 11, PAGE 7-8

Cleaning shell molded castings is done with low velocity blast directed over



entire area in Sly system. Bucket is only moving part. *W. W. Sly Mfg. Co.*

CIRCLE NO. 12, PAGE 7-8

Portable x-ray unit contains tube and transformers inside shock-resistant, waterproof housing. Head contains fine focal spot x-ray tube, and receptacle for connection to control panel. Self-

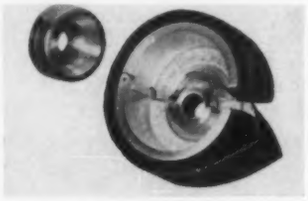
rectified circuit, 140 kv penetrates 1-1/2 in. of steel. *Balteau Electric Corp.*

CIRCLE NO. 13, PAGE 7-8

Portable space heater line includes oil and gasoline fired units in capacities from 50,000 to 450,000 btu per hr. *American Air Filter Co., Inc.*

CIRCLE NO. 14, PAGE 7-8

Drum sander uses ordinary strips of coated abrasives. Operates at speeds up to 6000 rpm on split 4 in. drum.



Abrasive strips perform same work as endless belt grinders. *American Diamond Saw Sales.*

CIRCLE NO. 15, PAGE 7-8

Power sweeper has cut sweeping costs 90 per cent at Gaines Co., Los Angeles foundry. Unit cleans 30,000 ft plant twice daily in 30 min and also is used outdoors for parking and storage areas. Total area swept is an

acre and a half and it is cleaned in two hours. Sulky arrangement allows operator to sit. *Modern Power Sweeper Co.*

CIRCLE NO. 16, PAGE 7-8

Cope and drag sealer No. 990 is designed to seal dry sand molds used immediately after removal from ovens while still hot. Stands up under 600 F. temperature. Comes in beaded

form, 30 in. in length. Prevents run-outs, blows and fins. *Presstite-Keystone Engineering Products Co.*

CIRCLE NO. 17, PAGE 7-8

Leather fillets for patterns feature feather edges, are pliable and easy to work. Made of pure oak tanned

leather. Made in various sizes. *Milwaukee Leather Belting Co.*

CIRCLE NO. 18, PAGE 7-8

Abrasive throwing wheel for airless blast cleaning operates on centrifugal principal. It is available in 2-1/2 x 19 in. size for machines in use as well as new models. The GM wheel reduces wear through use of spring

locking device. Blades are made from heat treated alloy steel. All components of wheel assembly except blades and locking devices are interchangeable with older wheels. *Wheelabrator Corp.*

CIRCLE NO. 19, PAGE 7-8

Portable abrasive belt grinder is air operated and weighs 6-3/4 lbs. Hand

tool has changeable handle positions and develops speed of 4700 sfpm, fits into classification between hand filing and large portable grinders. *Grinding & Polishing Machinery Corp.*

CIRCLE NO. 20, PAGE 7-8

Indirect arc furnace line features magnetic amplifier type arc control permitting variation in speed of the motor

control so that speed is directly proportional to unbalance. Motor-driven electrodes are automatically controlled. Capacities range from 350 to 4000 lbs, kw ratings from 125 to 600. Line is pedestal mounted. *Detroit*

CIRCLE NO. 102, PAGE 7-8

Electric Furnace Div. Kuhlman Electric Co.

CIRCLE NO. 21, PAGE 7-8

Combustion boats for carbon and sulphur determination made from zircon silicate are heat-shock resistant, carbon and sulphur free and resist pene-

tration of stainless steel and silicon steel slags. Tested in steel laboratories for two years. *Saxonburg Ceramics.*

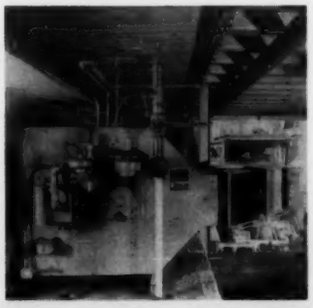
CIRCLE NO. 22, PAGE 7-8

Castable refractories, hydraulic setting, will not expand, shrink or crack with drying or burning and withstand sudden changes in temperature. Flint Cast 29 has high strength and service

limit of 2900 F intended for forming hearths, doors and supporting roofs, No. 30 has limit of 3000 F and has medium strength. *Robinson Clay Products Co.*

CIRCLE NO. 23, PAGE 7-8

Gas-fired space heating system installed by Grant Brothers Foundry Co., Detroit, reduced heating costs from $1000 to $300 monthly. Single



unit producing 2 million btu hourly heats foundry production area from four discharge nozzles. *Dravo Corp.*

CIRCLE NO. 24, PAGE 7-8

Gamma ray camera produces a conical beam of radiation 60 deg wide, allowing operator to work outside the beam. Two models manual or automatically operated. *Tracelab, Inc.*

CIRCLE NO. 25, PAGE 7-8

Vacuum furnace designed for precision casting operations is capable of 5 to 17 lb melts under vacuums as low as 2 microns. Unit measures 6-10 in. wide and 7-3 in. deep. Production cycles as short as 10-12 min are possible when vacuum-melted metal is used for feed stock. Cycle longer when air-melted stock is used which has to be gassed and further purified under vacuum. *F. J. Stokes Corp.*

CIRCLE NO. 26, PAGE 7-8

Binding agents for precision investment casting are designed for use in die casting of aluminum, zinc and alloys. Said to be odorless, smokeless, non-corrosive and non-toxic. Available in three viscosity-controlled grades. *National Aluminate Corp.*

CIRCLE NO. 27, PAGE 7-8

Shell molded casting cleaning equipment uses a low velocity blast. Advantages claimed include better control of cleaning action, nozzle patterns vary to fit area to be covered and cleaning mechanism may be operated continuously. The only moving part in abrasive system is bucket elevator. *Bayless-Kerr Co.*

CIRCLE NO. 28, PAGE 7-8

Reflecting objective microscope is designed for work in visible, ultra-violet and infra-red light. Optical system made of mirrors eliminating chromatic aberration. A wide range of reflecting objectives available (x 15 to x 172). *The Ealing Corp.*

CIRCLE NO. 29, PAGE 7-8

Induction furnaces have been used for analyzing hydrogen in a wide range of titanium and zirconium metals as well as hetal hydrides. Procedure is burning sample in stream of oxygen to convert hydrogen to water which is weighed in gravimetric bulb. Standard tank oxygen and special purification unit are used and sample heated in molten iron bath. Total analysis time is 5 to 10 min. *Laboratory Equipment Corp.*

CIRCLE NO. 30, PAGE 7-8

Die casting Model 600 machine is said to have power and rigidity to lock dies at better than 600 tons pressure. Hydraulic system designed to provide slow or fast injection

CIRCLE NO. 109, PAGE 7-8

speeds. A double acting, large capacity heat exchanger maintains uniform temperature of the hydraulic fluid at all times. *The Cleveland Automatic Machine Co.*

CIRCLE NO. 31, PAGE 7-8

Indirect arc furnace is a standard pattern conversion type, powered at 95 v by a 20 kva transformer which is separate from furnace. Weight of charge is 20 lbs maximum, maximum size of mold accommodated by clamp in cylinder 10 x 12 in, minimum size 2-1/2 x 4 in. Electrodes water cooled. Feature high purity alumina crucibles. *British Industries Corp.*

CIRCLE NO. 32, PAGE 7-8

Creep strain testers from Germany come in two models, one with units of five furnaces each containing a single sample, the other model tests up to 10 samples in a single furnace. Single-sample units used chiefly for untried materials. Testing temperatures range up to 1832F. Temperature readings are accurate to plus or minus 40F. Designed to provide long term high temperature testing conditions. *Mohr & Federhaff AG.*

CIRCLE NO. 33, PAGE 7-8

Adjustable pallet racks for pattern, core and casting storage are easily assembled without bolting or welding. Adjustable members lock in place at desired height and may be made up in multiple sections. Racks built to specification of desired material. *Palmer-Shile Co.*

CIRCLE NO. 34, PAGE 7-8

Vacuum induction furnace, tilt-pour type is designed for melting, refining, casting, annealing, sintering. Melt capacity 12 lbs steel, operating temperature 1700 C(3100 F). Model 2551 is a laboratory unit for study and development of metals and alloys. *National Research Corp.*

CIRCLE NO. 35, PAGE 7-8

Looking . . .

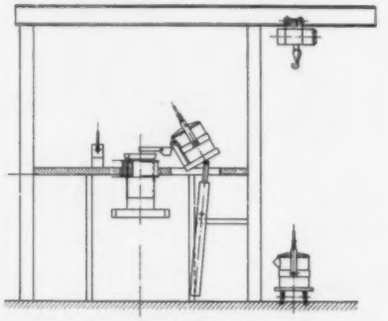
. . . for new production ideas? Circle numers on Reader Service cards (page 7-8) to get more information on products and services described in Products & Processes and For the Asking.

CIRCLE NO. 109, PAGE 7-8

Here are Short Summaries of Technical Papers Given at International Show

■ Foundry research results from around the world were disclosed at the International Foundry Congress in Dusseldorf, Germany, last September. Following are summaries of those papers considered by the editors of MODERN CASTINGS to be most pertinent to foundrymen in North America:

Pressure Pipes For Water and Gas are Being Continuously Cast at The Steel Works at Gelsenkirchen, Germany. A. Wittmoser reported



Equipment for continuous casting of iron pipe by German process.

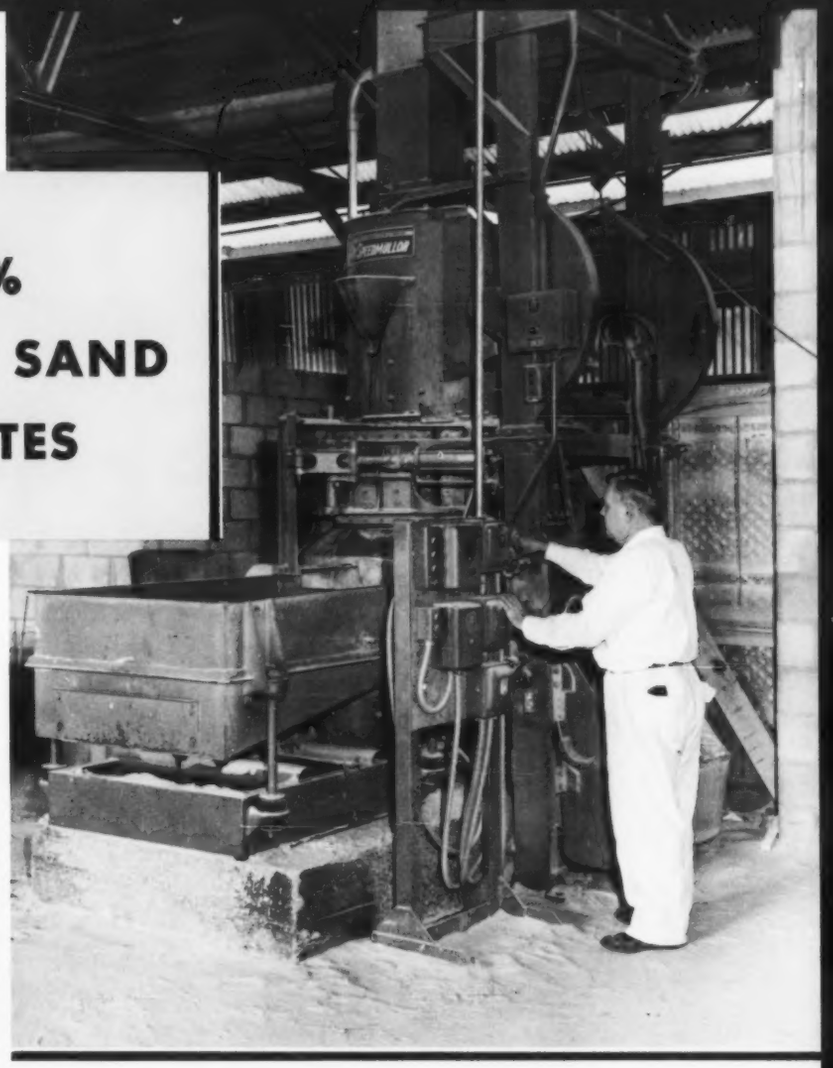
the technical and economic success of the process which casts gray iron pipe in diameters ranging from 16 to 39 in. and up to 33 feet long. The pipe may be cast with or without flanges.

Flushing Molten Gray Iron With Nitrogen Proved Beneficial As A Preliminary To Producing Nodular Iron With Magnesium Addition. It is well known that a part of the magnesium added to molten iron to nodulize the graphite must combine with the sulfur and oxygen present. Magnesium consumption can be materially reduced by desulfurizing and deoxidizing prior to the magnesium addition. In the U.S. soda-ash and calcium-carbide have been used to accomplish this action. W. Patterson at the Foundry Institute in Aachen, Germany developed the practice of scavenging the molten iron with nitrogen gas. Dissolved gasses as well as solid inclusions were flushed out of the iron. The consumption of magnesium in subsequent nodulizing

Continued on page 17

CIRCLE NO. 111, PAGE 7-8

A BATCH OF 4% RESIN-COATED SAND EVERY 6 MINUTES

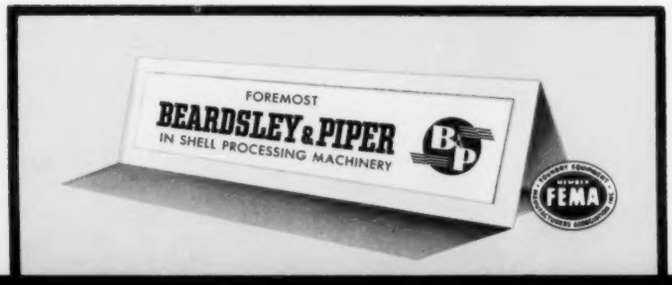


for shell molds

for shell cores

AT RACE AND RACE, Winter Haven, Florida, the same CP30 Shell Speedmullor resin-coated mix is used for both molds and cores. Speedmullor coating is so efficient that resin segregation is completely eliminated, even in shell coreblowing. Total cycle time for complete coating is five to six minutes, and maximum molding and coreblowing shell sand properties are obtained with 4% resin content. The efficient CP30 can prepare all of the shell sand required in a few hours a day.

At present, Race & Race, outstanding producer of aluminum pipe, employs twelve men in their shell operations. They've shown that even the small shell molders can successfully and efficiently utilize the most advanced shell sand preparation equipment . . . the Shell Sand Speedmullors. Send today for full information, write to Beardsley & Piper, Div. Pettibone Mulliken Corp., 2424 N. Cicero Ave., Chicago 39, Ill.



THE WORLD'S LARGEST EXCLUSIVE MANUFACTURER OF FOUNDRY MACHINERY

ing treatment was considerabl
duced and the quality of the
was excellent.

**A Study of the Productivit
Foundry Workers As Effecte
Environment Proved the Im
ance of Making the Found
Good Place to Work.** G. Leh
of Dortmund studied worker fa
as effected by various influe
in the foundry. Continuous
tronic recording of worker
rate proved an accurate indi
of fatigue. It was determine
these studies that the use of
pressed air hammers for cle
castings did not produce fa
unless the operator has to as
unfavorable postural positi
Since such is usually the case,
attention should be given to
ing the castings in a convenien
sition to be worked on. Exp
to radiant heat increases the
beat thereby rapidly bringing
fatigue. A simple screen to
tect workers from this sour
exhaustion will soon pay for
with increased productivity.
cular fatigue also results
foundry fumes, dust, and espe
noise. Many foundry noises ar
ficiently intense to bring abo
tigue through nervous strain
duced by the occurence of or
reactions. Sound absorbent fo
tions and shields are subtl
nevertheless positive aids to
er productivity.

**Shock Heating of Green Sa
Molten Metal Results in Expa
Scabs, Buckles, and Rattails.**
Levelink of Rijswijk, Holland
a series of studies with specia
pieces heated under controlle
ditions. Under conditions
the surface-layer of sand is f
expand freely in the directi
the surface this surface-layer
off from the underlying mate
a whole. If the surface-layer i
vented from expanding in th
ection of the surface then this
will bulge and only partially
off. In this work it was decide
peel formation depended on t
hesion of the sand in a wet
which is formed between the
surface-layer and the moist
behind. The type of clay i
sand influences this property
impeded expansion conditions

CIRCLE NO. 111, PAGE 7-8

Meets *many* needs of power plant castings with a single 2.0% Nickel iron

"When I called at the Hardin Foundry", said Chuck Wright, Inco Distributor Foundry Specialist, "Al Grant was hip-deep in blueprints and shaking his head."

What troubled Al was an order for ¼-million pounds of power plant castings: condenser boxes, pumps and valves. He wanted one basic iron to meet the somewhat incompatible requirements of all.

For example, the condenser boxes (5′ x 9′6″ x 9′6″) called for a dense iron with a minimum strength of 35,000 psi. Plus resistance to corrosion.

The pumps (42,000 lbs. total weight) had to meet strength requirements of 40,000 psi, test pressures of 35 psi . . . *and* have good corrosion and erosion resistance.

The 15-foot-long reversing valves demanded strength as high as the pumps and extra wear resistance for the seats.

"You can meet all the requirements with nickel," I said. "A good basic iron of 3.0 to 3.2 carbon aiming for 1.6 silicon and 2.0% nickel will do it."

A 2.0% nickel iron provides the strength and density needed for all these castings. The graphite refinement brought about by nickel aids corrosion resistance. It also gives the hardness needed for erosion and wear resistance.

"With nickel iron," I said, "you should be able to maintain good structure uniformity in both heavy and light sections. And even though the iron is dense and hard you'll get the machinability you want."

The suggestion was all that Al needed. With this 2% nickel iron plus the good casting practices that prevail in his shop, he was able to handle the job easily.

When you have a problem in the metallurgy of castings, call me over. You may not have the same problem as Al Grant. But I'll be glad to help. No matter how large or small your foundry. You can reach me at Inco.

Chuck Wright

The International Nickel Company, Inc.

67 Wall Street New York 5, N. Y.

ing to buckling may be influenced by the sand additives woodflour, pitch, and coal dust.

Irons Which Would Normally Solidify White Can Be Made Gray by Flushing With Nitrogen Gas. This technique is being used in France on an industrial scale to prevent low carbon low silicon irons from solidifying white when cast in thin sections. G. Blanc and N. Volianik of Paris report that the iron is also free from inclusions and has improved castability. The graphitizing or inoculating effect of the gassing does not wear off like ferro-silicon in a few minutes but remains for longer than an hour. The effect was also noticed when air or oxygen was used as the gas but changes in composition led to the preference for nitrogen.

Stockholm Will Be Host To '57 International Meeting

■ Ventillation in foundries and testing of cast metals, particularly mechanical testing, will be the themes of the 24th International Foundry Congress to be held August 19-24 in Stockholm, Sweden. The congress will be held in the Parliament building

Parliament building located in center of Stockholm will be headquarters of congress.

and is sponsored by Sveriges Mekanforbund in cooperation with the foundry technical associations of Norway, Denmark and Finland.

Plant tours will be conducted during the congress and post congress tours will be made through Sweden, Norway, Denmark and Finland.

The tentative program includes the opening of the congress Monday, August 19 with afternoon technical sessions or plant visits concluded with an informal dinner in the evening. Tuesday will feature plant visits. On Wednesday technical sessions will be held with simultaneous interpreting in English, French and German.

let's get personal

Central Foundry Division, General Motors Corp., has announced a series of executive promotions. **Elmer E. Braun** has been promoted to divisional works manager. In this post he will be responsible for activities in manufacturing, engineering, sales, and production control. **Leslie L. Shafer** has been named sales manager for the division. He was formerly assistant sales manager. **Richard S. Smith, Jr.,** former public relations director, has been named divisional personnel director. He replaces **Gordon S. White** who has been named plant manager of the division's Definance, Ohio, operation. **Charles E. Drury,** former factory manager at Saginaw, now becomes plant manager of the division's Danville, Ill., plant where he replaces **R. V. Righter.** Righter, a director of AFS, will join the staff of the vice-president in charge of personnel for the corporation.

George T. Dupre . . has been appointed assistant to the president of the National Engineering Co., Chicago. Most recently Dupre has been in charge of advertising and sales promotion activities and his new duties will include these functions.

Clyde Wyman . . has moved to northern California as manager of product development for Vulcan Steel Foundry. Wyman was formerly chief metalurgist for Burnside Steel Foundry Co., Chicago, and is chairman of the AFS Steel Division Research Committee.

U. S. Pipe and Foundry Co. has new resident managers at its Chattanooga, Tenn., and Decoto, Calif., plants. The changes followed retirement of **C. R. Tinsley** from the Decoto plant. **Paul L. Arnold** moves from post as resident manager of the Chattanooga plant to manager's spot in Decoto. Arnold is also president of the National Foundry Association and the National Castings Council. He will be succeeded at Chattanooga by **Howard M. Barker,** production superintendent. Barker is a former director of AFS.

Corn Products Refining Co. has announced appointment of four regional sales service managers. **C. J. McDowell, R. F. Cohee, R. D. Walter,** and **E. W. Beardsley** have been named to these positions in the eastern, central, southern, and western divisions of the company.

Kenneth E. Fritz . . has been named to the metallurgy unit of the materials and processes laboratory of General Electric's large steam turbine-generator department. Fritz is a member of Sigma Gamma Epsilon, AFS, and ASM.

James H. Tomkins . . has been appointed director of research for the

G. T. Dupre

P. L. Arnold

H. M. Barker

plastics division of the Smooth-On Mfg. Co., Jersey City. He will concentrate on development of epoxy resin compounds, the firm's newest product line.

A. N. Wallin . . sales representative for the S. Obermayer Co. is celebrating his 50th year with that firm as a salesman of foundry facings, supplies and equipment.

Gordon C. Curry . . eastern sales manager of Precision Castings Co., Fayetteville, New York, has been elected a director of American Die Casting Institute.

C. E. Coulter

The technical sales and field service staff of the Foundry Products Division, Archer-Daniels-Midland Co., Cleveland, has been reorganized and expanded as a result of the firm's recent introduction of three new binders for the castings industry. Warner Bishop, ADM vice-president, has made the following appointments to his staff: **C. E. Coulter** has been

D. R. Chester

named western sales manager. Coulter is past AFS chapter director. **Daniels R. Chester** has been appointed manager, technical service. He is a member of the AFS Sand Division Core Test Committee. **Anton Dorfmueller, Jr.,** is now eastern sales manager. Dorfmueller is a former treasurer of the AFS Canton Chapter.

F. E. Loeffler . . has been named manager of sales promotion for Electro Metallurgical Co., division of Union Carbide and Carbon Corp. Loeffler started in the Union Carbide patent department in 1932 and transferred to Electromet in 1945.

John A. Carrington . . has been appointed general sales manager of Harvill Corp., Los Angeles, and will direct an expanded national sales program for all divisions of the firm.

A. Dorfmueller, Jr.

Carl E. Rowe . . has been appointed vice-president and general manager of Milwaukee Valve Co. Rowe was previously associated with Pressco Casting and Mfg. Co., Chesterton, Ind., as vice-president in charge of manufacturing.

Howard H. Wilder . . formerly assistant manager of engineering sales, Vanadium Corp. of America, has been appointed manager of that operation

H. H. Wilder

and will have his headquarters in Chicago. Wilder is a member of several committees in the Gray Iron Division of AFS.

Norton Company has announced the appointment of two field engineers and two abrasive engineers in the Detroit area. **William Pettigrew** and **Frank W. Krohn** are the field engi-

neers and **Russell J. O'Neil** and **Lincoln M. Johnson** are the abrasive engineers.

William J. Ryan . . has been appointed shop superintendent for Cleveland Crane & Eng. Co., Wickliffe, Ohio.

F. John Pichard . . has been promoted to the post of manager, standard equipment sales at Wheelabrator Corp., Mishawaka, Ind. He was for-

F. John Pichard

merly on the staff of the firm's New York sales office, handling all of the company's products.

R. C. Wood . . vice-president of Minneapolis Electric Steel Castings Co. has been elected president of the Boy Scout council serving the Twin Cities and has been given the Silver Beaver Award for outstanding service.

Rawson L. Wood . . president of Arwood Precision Casting Corp., New York, has been elected chairman of the Council of Profit Sharing Indus-

Rawson L. Wood

tries. Wood is a pioneer in the profit-sharing movement and his firm is a charter member of the council.

Link-Belt Co. has announced the appointment of five district managers. **G. A. Most, Jr., J. C. Bullock, G. A. Zwerner, C. C. Wiley,** and **Paul Waldorf** have been named to these posi-

tions in the Boston, Moline, Albany, Washington, and Baltimore offices.

Frank S. Bilton . . has been named purchasing agent and traffic manager for Foundry Services, Inc., Columbus, Ohio. He was formerly with Leeds and Northrup Co. and Riverside Metal Co.

Thomas W. Johnson . . has been elected vice-president of the New York Air Brake Co. Johnson now has charge of the firm's Vacuum Equipment and Kinney Mfg. divisions.

Clair Crawford . . succeeds **John Nabrezny** as chairman of the AFS Detroit chapter. Nabrezny resigned the post because he is leaving Detroit to move to a new position with the Curtiss-Wright foundry in Buffalo, N. Y.

John R. Gorey . . has been appointed sales promotion manager for Lindberg Engineering Co., Chicago, and will also continue in his present position as public relations director.

R. H. Cullen . . joined Sterling Grinding Wheel Co. as an abrasive engineer and will represent the firm in central and southern Indiana.

H. J. Halliday . . former purchasing agent has been promoted to director of purchases for Jeffrey Mfg. Co., Columbus, Ohio.

James Boyd . . has been named an abrasive engineer for the Peninsular Grinding Wheel Sales Corp. and will cover the Pittsburgh area.

Enoch While . . chief inspector at Allis-Chalmers Norwood (Ohio) Works has been named works manager there succeeding **J. F. Costigan,** recently appointed assistant director of manufacturing.

Otto H. Harer . . is now associated with Atlas Matchplate Co., Chicago, as pattern shop and foundry consultant.

Theodore Padkins . . has been named works manager, Scullin Steel Co., St. Louis, succeeding the late J. D. Walsh.

Herman E. Mandel . . has been elected secretary-treasurer of the AFS Philadelphia chapter. He will serve for the unexpired portion of W. B. Coleman's term.

E. C. Sargent . . has been named president of the Zirconium Corp. of

America, Solon, Ohio. He succeeds N. V. Coyle who remains as chairman of the board.

Paul Schwartz . . has joined the supervisory staff of St. Louis Steel Castings Co. as assistant to plant superintendent.

Joseph B. Lanterman . . vice-president of American Steel Foundries has been elected to the firm's board of directors.

Harry Czyzewski . . founder of Metalurgical Engineers, Inc., Portland, Ore., has been named president of the Professional Engineers of Oregon.

THE FOUNDRY BEAUTIFUL

Eyes that behold the beauty of the
first unfolding rose
Of Spring in gorgeous finery, in green
and flowery clothes;
Bards who rant in ecstacy of yellow
daffodils,
Of clumps of purple violets, rhododendrons in the hills,
Could they comprehend the beauty
of a steaming pile of sand?
One must have the eyes to see; the
mood to understand.

Ears receptive to the rhythm of a
lovely symphony,
A concerto, an aria, imperfect rhapsody.
Ears that love the syncopation that
modern rhythm "sends,"
Ears that hear the classics or are
prone to later trends,
Would the foundry's roars and rumblings match a military band?
Pounding, grinding, tooting, screeching—the music of a band?
One must have the ears to hear; the
mood to understand.

A thousand sights and sounds and
smells, each related to another.
Things which one man sees as glorious are lost upon his brother.
Of a thousand million living souls
who walk this earth today
Each one conceives his beauty in
his own peculiar way.
Who will walk into a foundry and
think it truly grand?
Who'll believe this monstrous, terrifying, dusty foundry's grand?
One must have the eyes, the ears,
the mood to understand.

■ From *The Foundry Bard*, a column of foundry poems appearing in *The ESCO Ladle* of the Electric Steel Foundry Co., Portland, Ore. Bill Walkins, former sand mill operator, is both the editor of the *Ladle* and the one, and original, Foundry Bard.

the editor's field report

by J H Schaum

◗ **Epoxy Resins:** Almost everyone is trying to use epoxy resins to solve or simplify some problem in their operation. We have seen it used to patch patterns and castings, fabricate patterns and core boxes, glue everything to anything, make magnetic or non-magneitc jigs & fixtures, mount metallographic specimens, stop plumbing leaks, and so on. Now the precision casting manufacturers are experimenting with the use of epoxy resins for making wax injection dies. In a recent conversation with one such castingman I learned that excellent dies can be made. But their low heat conductivity slows down the wax solidification, especially in heavy sections, so that productivity is seriously impaired. Even with powdered copper or brass filler the insulating effect of the resin about the particles destroys the conductivity. However the problem may be licked with an idea (patent pending) utilizing steel or copper wool as the filler material. This furnishes a continuous high conductivity path for heat extraction thereby effecting rapid cooling of the wax. With low melting alloys being poured successfully at 400 F into epoxy molds, it is not surprising that the shell molding people have their eye on epoxies as a material for rapid inexpensive production of patternplates. Announcement of success in this field is expected soon.

◗ **Quick Action:** After reading the article on preserving bottom boards in the November issue of MODERN CASTINGS, a foundryman in the Chicago area had his men come in the following Saturday morning for a special project. They gathered all the wooden bottom boards available and soaked them in a solution of dilute sodium silicate. Both the old and new boards were given the treatment. In a few months we hope to be able to report what they think of the process.

◗ **New Casting Facilities:** General Electric Company evidently believes strongly in the future for castings. To prove it, a new 800 foot long building is under way at Schenectady to house the latest modern casting facilities. Included will be a precision casting foundry and a specialty casting foundry for shell molding—both designed for production. The Applied Research and Development Laboratory, with some of the finest vacuum melting and casting equipment in the country, will also occupy an important part of this structure. Operations are scheduled to start in the spring of '57.

◗ **Michiana Chapter Assists New Industrial Institute:** Ash Sinnett, AFS Education Director, reports a donation of $50 by the Michiana Chapter to provide all the AFS texts applicable to foundry instruction at the industrial institute of the Community College, Benton Harbor. They are also assisting in procuring necessary equipment and supplies for establishing the foundry. This institute is one of the first established with a two year terminal program for turning out top quality technicians for industry.

◗ **Air Conditioning in the Foundry:** Who would have ever thought that selected spots in the foundry could be air conditioned? Well George Edwards, President of Woodruff & Edwards, Inc., not only did but did something about it. The February issue of MODERN CASTINGS brings you all the details of another "Foundry First"—Localized Spot Air Conditioning in the Foundry.

◗ **Graphite Thermocouples for High Temperatures:** Measuring temperatures of molten iron and steel by immersion thermocouple techniques is usually considered expensive and delicate. While visting the new National Carbon Co. Research Laboratories, I learned of a new all-graphite thermocouple capable of measuring temperatures as high as 2500 C (4532 F). One element of the couple is the conventional *n*-type graphite while the other element is *p*-type graphite, a semi-conductor. If you are concerned about carbon contamination of the melt, a refractory wash or sleeve may be used. More details about this development will be told in a forthcoming issue.

pouring off the heat

happy brass hat

■ Thank you for your most encouraging comments about our conservation program and particularly for your reference to the growing use of manganese-type stainless steels. We feel strongly that it is in the long-range public interest that private industry become skilled in devising and employing suitable alternate materials like these. It is gratifying to know that you believe our program has yielded tangible results in this direction. Technical societies and journals like yours play an important part in generating national awareness of the need for conservation and in disseminating information on ways to achieve it.

FRANK D. NEWBURY
Assistant Secretary of Defense

pleased author

■ We have read the October issue of MODERN CASTINGS with a great deal of interest. We were particularly pleased with the manner in which you handled the material for the Bonus Section on Core Blowing. I might mention further that your efforts month after month in MODERN CASTINGS are certainly appreciated by myself and many of our associates and friends with whom we discuss various foundry problems.

ARTHUR M. CLARK,
Ford Motor Co.

disappointed youngsters

■ About a year ago I started a scrap book for my two young sons for the express purpose of saving the pictures showing "Castings Through the Ages." I have been quite disappointed in not finding this interesting and educational feature in the last two issues of MODERN CASTINGS. If this feature has been dropped permanently from the contents of MODERN CASTINGS would you please advise me if it is possible to get copies of this feature from past issues.

Leonard R. Woehkle
Grede Foundries, Inc.

Fear not the permanent loss of this monthly lesson in castings' contributions to history. This department was only temporarily out of production due to alterations required for the 1957 model-and has been resumed on page 75, of this issue. Editor.

GIFS Forecasts Record Year For Gray Iron Casting Sales

Market Survey Shows Needs of PA's and Designers

■ A record-breaking year for gray iron castings is forecast by Richard Meloy, marketing director of Gray Iron Founders' Society if foundrymen apply some of the lessons learned in a recent GIFS survey.

Reporting to the 28th annual meeting of the society at the Homestead, Hot Springs, Va., November 1 and 2, Meloy disclosed that the survey shows purchasing agents and design engineers desire assistance from foundrymen in the design of patterns and castings to achieve lower costs and improved quality. Replies to a series of questions to the GIFS survey indicated a strong need for a broad educational program covering the technological advances of the gray iron foundry industry.

"Because your sales effort is not

Peter E. Rentschler receives Gold Medal from Hermann Good.

keeping pace with your technology," according to an address presented at the meeting by W. S. Thomas, vice-president, Emmaus Foundry and Machine Co., "your casting business is losing ground to other methods of fabrication." The speaker pointed out the tremendous progress made in the improvement of physical properties of gray iron in the last decade but the sad lack of communicating this information to customers, prospective customers, and design engineers.

For leadership in progressive foundry management with particular reference to good housekeeping and safety practices, and improved industrial and public relations, Peter E. Rentschler, president, Hamilton Foundry & Machine Co. received the association's highest award—the Gold Medal.

In the annual redesign contest three foundry executives received cash awards for economical substitution of gray iron for competitive material. Winners were J. E. Rohrer, New Holland Machine division of Sperry Rand Corp., R. C. Mueller, Universal Foundry Co., and V. Gleasman, Positive Drive Corp.

Also honored in recognition of their outstanding service and unselfish devotion to the advancement of the gray iron industry were: Summerfield Brunk, Headford Bros. & Hitchins Fdry Co.; Ray T. Lewis, Keen Fdry Co.; James W. Simmons, Jr., Cox Fdry & Mach. Co.; and E. J. Bothwell, International Nickel Co.

The annual reports of nine committees demonstrated the activity of the society during the year. These activities include several publications including The GIFS Buyers Guide which will soon be completed. As the result of a two-year effort a booklet has been prepared entitled "Engineering and Purchasing Requirements for Gray Iron Castings." The revised "Summary of Specifications" was reviewed and released for publication. All but five sections of the Gray Iron Handbook are completed. The Cost Committee has decided to publish a book containing about 50 Cost Articles, is preparing a third Cost Manual on Cost Control, and working on material for "Cost Factors in Purchasing Castings" to be used in the Handbook. The Safety Committee reported the development of a safety program which will be of substantial help to member foundries in reducing the frequency of disabling injuries in their operations. A statement of the GIFS safety objective was formulated as follows: "It is the objective of the Safety Committee of the Gray Iron Founders' Society to prevent accidents in the Gray Iron Industry by developing and promoting practical safety and good housekeeping activities among members to eliminate human suffering and increase productivity and profits."

To influence design engineers in industry and to educate them to the advantages of gray iron castings, the society has decided to exhibit at a design engineering exhibition in 1957.

New officers of the society are: President, J. Scott Parrish, Jr., Richmond Foundry & Manufacturing Company, Inc.; Vice-President, A. M. Nutter, E. L. LeBaron Foundry Company; Secretary, A. H. Renfrow, Renfrow Foundry; and Treasurer, H. J. Trenkamp, Ohio Foundry Company.

GIFS Board of Directors and guests: C. F. Walton, A. L. Dyer, A. M. Nutter, E. T. White, A. H. Renfrow, W. Z. Taylor, Charles H. Ker, J. S. Parrish, Jr., H. J. Trenkamp, Earl Paltenghi, C. H. Meminger, D. H. Workman, C. S. Wieland, Hermann Good, F. G. Steinbach, and W. L. Seelbach.

the SHAPe of things

safety, hygiene, air pollution

by HERBERT J. WEBER

Don't Be Sucked in by a Downdraft!

Some time ago I was confronted with the problem of exhausting fume from a sprue-burning-off operation.

The weight of the castings varied from a few hundred pounds to several tons. The burners were paid on a tonnage basis. Castings were spread around on the burning floor and the workmen moved from place to place cutting off the sprues with a torch. The work position insured that the men breathed the maximum in fumes.

The company installed roof ventilators but they exhausted the fume only after the men received a full dose of it. Then flexible exhaust tubes were tried but it took almost as long to position the tube as to make the cut. Since the men were on incentive pay they wouldn't bother to move the exhaust tube and you wouldn't blame them. Later side draft hoods were installed but the workmen couldn't wait for the crane to place a particular casting in front of the hood especially when the crane was working the other end of the cleaning room just when it was needed on the burning floor.

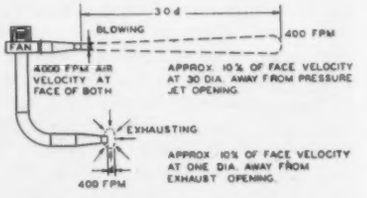


Fig. 1 . . At nine in., no drag.

Then someone thought of a down draft! The idea was to install a large grate in the floor and connect it to an exhaust duct. Now the troubles with the other three attempts would be over. But they weren't because an important principle of air flow was overlooked. In the accompanying Fig. 1 it is seen that with the same volume of air drawn through an opening, the face velocity varies from 4500 fpm through the 4 in. opening to 720 fpm through the 10 in. opening. It is of particular interest to note that contrary to what might be expected, all of the openings create approximately the same velocity at a distance of only 6 in. from the opening. Also of importance, the velocity approaches zero at a distance of only 9 in. from the opening.

Thus it is apparent that downdraft is limited for the following reasons:

1. For large castings where the sprue to be burned off may be over 3 ft above the floor, air velocity at the point of burning will be negligible.
2. On a burn-off operation, heat causes fume to rise counter to the pull of the exhaust system.
3. Large castings on a downdraft-floor grate choke off suction, thus nullifying the effect of the system.

Downdraft for burn-off may have application if:

1. The castings are small and well spread out so that the cutting torch can direct fume into the exhaust opening.
2. The castings are large but so placed that the sprue is within a few inches of the exhaust grate and there is no choking off of draft.

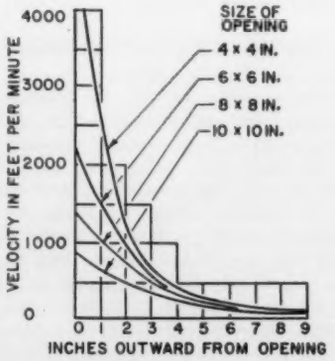


Fig. 2 . . The unbeatable curve.

In designing any ventilation system, it is well to keep in mind also the principle of air flow shown in Fig. 2.

So before being sucked in by a downdraft, study these illustrations carefully.

committees in action

The Round Table Conference Subcommittee of the Brass and Bronze Division met in Philadelphia, September 20, with 18 present. It was decided that the convention schedule of the Brass and Bronze Division would include Technical Sessions at 9:00 am and 2:30 pm on May 9 and a Round Table Breakfast at 9:00 am with a Technical Session at 2:30 pm on May 10. The breakfast program will have three men talk for 15 minutes each on the subject of CO_2 molds and cores.

C. E. McQuiston, Secretary of the **Mold Surface Committee,** has prepared a short concise paper on the "Design of Experiments." Copies of this paper, describing techniques for the statistical analysis of data to yield experimental efficiency, may be obtained from the AFS technical director.

The Shell Molding Materials Testing Committee met in Pittsfield, Mass., September 26, with 12 present. J. E. Bolt was elected new vice-chairman of the committee. Due to unsatisfactory results it was decided that R. A. Rabe should make additional tests with the tentative standard test pattern for shell molding materials. A questionnaire requesting problems facing the shell molding industry was sent to all members of this committee. L. Stark and J. E. Bolt were asked to develop a procedure for making standard tensile tests specimens by blowing coated sands. A tentative standard for determination of resin content of shell molding sands was prepared by E. I. Valyi and R. E. Melcher and is now being rewritten by J. G. Smillie.

The Industrial Engineering and Cost Committee met in Chicago, September 28, with 10 present. A new vice-chairman, J. A. Westover, was elected. Suggestions for papers to be obtained for the 1957 Castings Congress included—"Improving Foundry Layout," "Materials Handling," "Costs and Their Relation to Profit," "Job Evaluation," and "Memomotion to Set Standards." Several films will also be obtained. Committee members are collecting material for preparation of Chapter Talks on Work Simplification, Time Study Rating, Memomotion Study, and Standard Data.

dietrich's corner

by h. f. dietrich

Walking through a foundry a few weeks ago, I noticed an interesting operation. A time study man with stop-watch fastened securely to an analysis sheet pallet was timing a squeezer molding operation. The molder was doing his best to perform a normal operation. While I watched the cooperative effort it reminded me of the industrial relations progress made by engineers of the stop-watch.

When we think of it, it hasn't been many years ago when the first stop-watch was brought into the foundry. The first stop-watch operator of my acquaintance knew less about time study than a hog knows about calculus. But some correspondence school taught him to start and stop the watch and sent him into the world to annoy workers in general. He knew less about foundry practice than he did about time study. His former experience was timing machine operations in a cooky factory. It was in 1924 when I met this self-styled business wizard.

I had hired out as a bench molder in a progressive foundry in the Milwaukee area. Someone I had not seen had thrown a split-pattern rope-sheave on the bench and promptly left for parts unknown to see whether I could make the job in the two part flask that had been placed on the bench with it. Foremen had their own unique way of learning whether a man was a mechanic, or whether he would go over the back fence.

When I unrolled my apron and placed the slick, trowel, and lifter on the tool shelf, my bench partner came over to introduce himself in broken English. He examined my tools for wear to determine whether I was a window molder, and welcomed me with garlic ladened breath. All of this procedure seemed normal to me; it was a way of life in the foundry.

Before I could set the bench up to run the rope-sheave, a stop-watch jockey boiled out of the swinging doors of the boy's room where he had been hiding, and headed with determination in every feature toward Tony's bench.

In the discussion which followed, the efficiency wizard, with unnecessarily forceful language, explained to Tony that according to the evidence of the carefully hidden stop-watch, Tony had been dogging half of his time away. He further explained that he had timed every operation made on the last three molds, discounting the time Tony left the floor for various reasons, and that he had proof that time was being wasted.

Although Tony, who thought of himself as a conscientious worker, had lost all command of English in his irritation over being accused of loafing, I could gather from his actions that when a man had to go he couldn't take the mold with him. He also seemed to be offering to give the cooky timer a short haircut with his cleanly scoured shovel to prove that he was an efficient workman.

At this point in the wrangle I began to roll my tools into my apron in preparation to leave what threatened to be a messy locality. I never learned whether Tony proved himself an efficient barber, but I felt that he was justified in trying to practice. He could never have found a more deserving customer.

We must admire our present day production control men with their open watches, shop and school trained personnel, research methods, and cooperative attitude. It took years of honest and fair dealing, education, and hard work to overcome the distrust generated among the workers by the Efficiency Expert.

H. F. Dietrich . .

. . is the gen-u-wine article, a real foundryman. He spent five years of his youth working his way from Milwaukee to Portland, Ore., as a journeyman molder in steel foundries. When things picked up after the depression, he turned his hand to gray iron molding. After the 8th grade, Dietrich abandonded formal education until he entered college in 1948 at the age of 42. He is now head of the foundry department, Kansas State College.

W. H. McFadden, Former AFA President Dies

■ W. H. McFadden, president of the American Foundrymen's Association 1906-07 and sponsor of AFS's William H. McFadden Gold Medal, died November 1 in Fort Worth, Tex., at the age of 87.

Mr. McFadden was self-educated and had a varied career including oil and steel, finance and philanthropy

W. H. McFadden

and at his death headed an oil royalty company which had properties in 12 states.

He was born in Moundsville, W. Va. and as a boy moved to Pittsburgh. In 1888 he began as an apprentice at Mackintosh, Hemphill & Co., receiving $3.50 weekly. During his three-year apprentice program he accumulated 17 months in overtime.

In 1893 he became foreman of the open hearth steel department and in 1894 general plant superintendent. In 1896 he advanced to assistant manager and in 1902 to vice president and general manager, becoming president 27 years after starting as an apprentice. Under his supervision many of the nation's largest steel mills were constructed.

Because of poor health he moved to Ponca City, Okla. and entered the oil business where he amassed a fortune. He served as mayor of Ponca City from 1914-20.

Mr. McFadden was very active in civic affairs and youth programs. He was named to Oklahoma's Hall of Fame in 1935 for his philanthropic work.

New Malleable by Albion

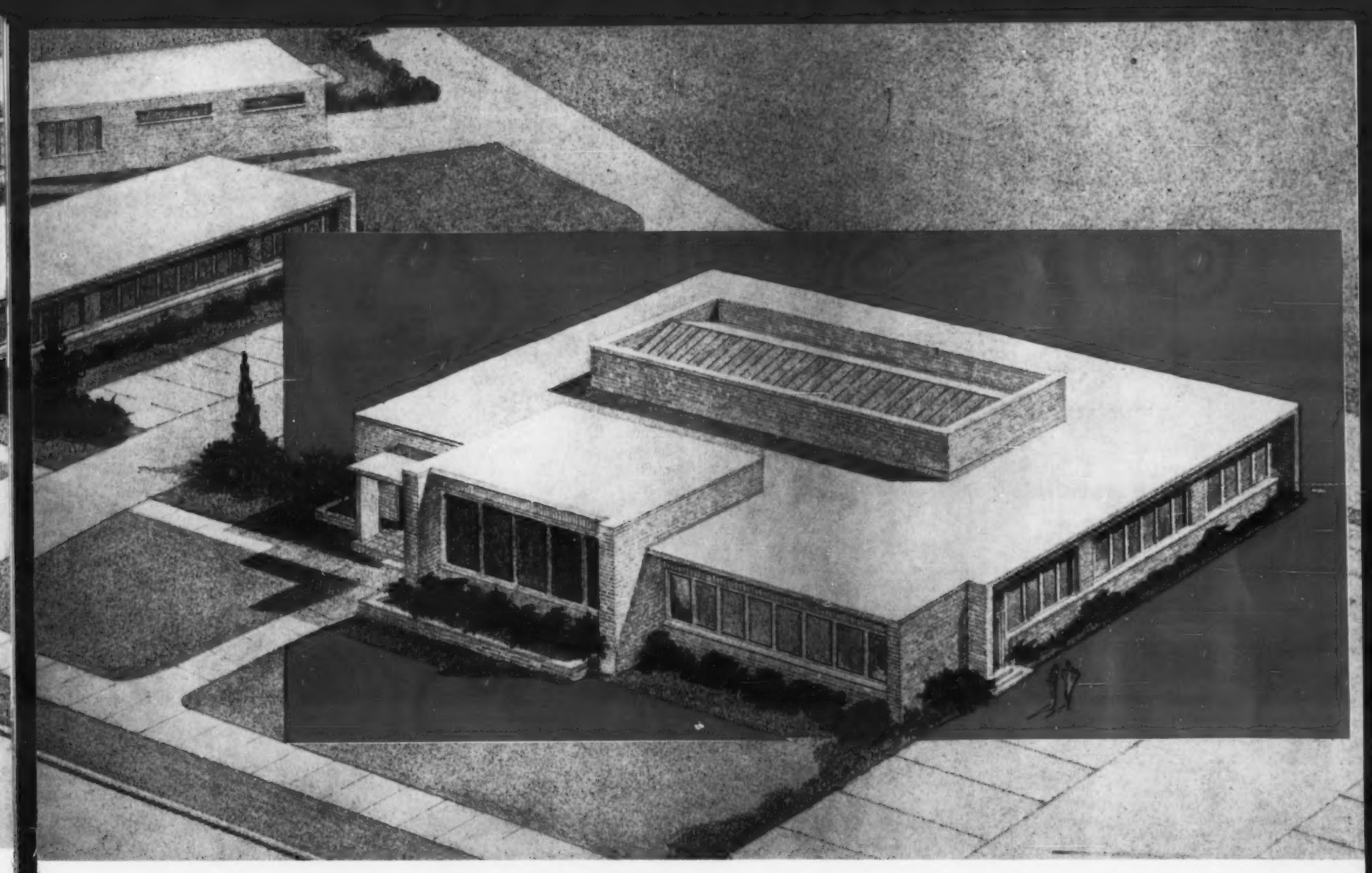
Malleable iron with the graphite in the form of true spherulites instead of the conventional "popcorn" type is being commercially produced by the Albion Malleable Iron Company, Albion, Mich. Addition of abnormal amounts of sulfur to the cupola or in the ladle account for spherulitic graphite precipitated during heat treatment. Further advantage arises from the carbide stabilizing effect of the sulfur.

Training for supervisors is the primary purpose of the Foundry Training Center which will be built near the present AFS headquarters building at Des Plaines, Ill. Intensive one and two-week courses will be conducted at the Center under the direction of the recently established Training and Research Institute.

AFS Training and Research Institute Established to Aid Industry

Foundry Training Center to be built as part of program of new AFS educational and scientific foundation

Institute trustees: left to right, F. W. Shipley, H. W. Dietert, B. L. Simpson, Hyman Bornstein, G. H. Clamer, and I. R. Wagner.



The American Foundrymen's Society has acted to advance the castings industry's "two most valuable properties: men and methods." Construction of a Foundry Training Center for intensive job training of foundry personnel was approved unanimously, November 16, by the AFS directors. At the same time the formation of a Training and Research Institute, as a foundation to advance the educational and scientific objectives of AFS, was announced.

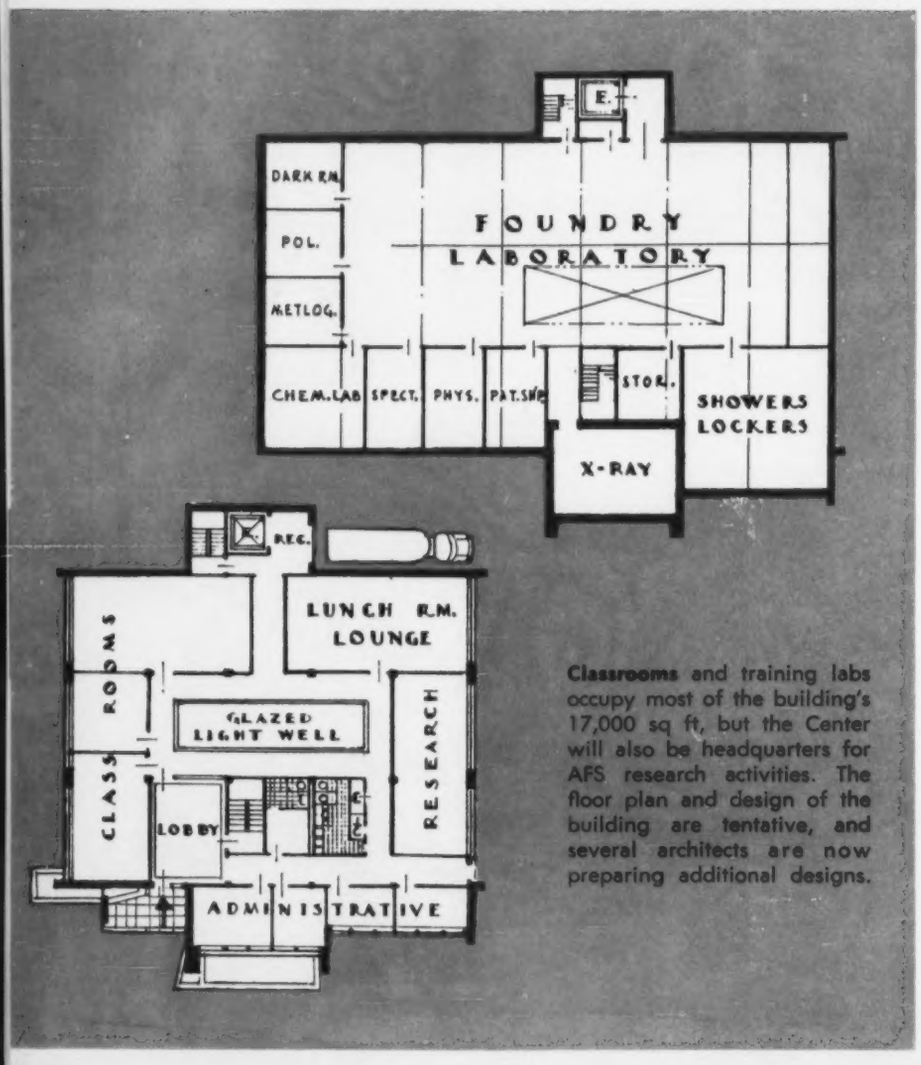
Seven leaders from the industry will be appointed as trustees of the institute and will enter into a trust agreement which officially establishes the institute as a permanent foundation. This action culminates efforts begun in 1942 by AFS leaders to "establish the educational and scientific objectives of AFS on a permanent basis."

The first six members of the trustees have been named. They are: AFS President F. W. Shipley, Caterpillar Tractor Co., Peoria, Ill.; AFS Vice-President H. W. Dietert, H. W. Dietert Co., Detroit; AFS immediate past president, Bruce L. Simpson, National Engineering Co., Chicago; AFS past president and McFadden Medalist Hyman Bornstein, formerly of Deere & Co., Moline, Ill.; AFS past president and Seaman Medalist G. H. Clamer, Ajax Metal Div., H. Kramer & Co., Philadelphia; AFS past president I. R. Wagner, formerly of Electric Steel Castings Co., Indianapolis.

The Training Center will be the first such school in North America owned and operated by the industry to provide foundry job training. It will be built on the site of the society's present headquarters building in Des Plaines, Ill. The project will be financed by the society and the industry, and will be operated as a major activity in a five-point program outlined for the newly created institute.

The new institute will be devoted exclusively to educational and scientific development of the metal castings industry and will be responsible for the research and education-training activities formerly carried on under AFS auspices. To finance institute functions, funds normally budgeted by AFS for these activities will be transferred to the institute, plus funds made available as a result of the institute's own program.

In announcing the society's pro-



Classrooms and training labs occupy most of the building's 17,000 sq ft, but the Center will also be headquarters for AFS research activities. The floor plan and design of the building are tentative, and several architects are now preparing additional designs.

gram, AFS President Frank W. Shipley stressed the industry's need for trained personnel to produce the increased tonnages to cast metals expected in the future. "Our industry," he said, "anticipates a 25 to 30 per cent increase in castings demand over the next 25 years. To meet this challenge, our industry must have better trained men.

"The new Training Center will help bridge the present tremendous gap between the boys who enter the industry from the high schools and vocational schools and those who come to us from the great engineering colleges and universities. No industry-wide facilities now exist for up-grading and intensive training of line and middle supervisors, the key men in all foundry production. In-plant trainee and apprentice programs are relatively few, due to high cost and lack of means and personnel."

It is intended that short, intensive courses in foundry operations and techniques will be offered in a year-round program primarily for foundry "middle" supervision. Courses are planned to cover such fundamentals as foundry sands, melting materials and methods, molding and core sands, foundry safety and environmental control, patternmaking methods and materials, materials handling techniques, and laboratory control procedures.

Present planning indicates that courses will be offered 32 weeks in each year. Each course will not exceed one or two weeks in length, so that operating personnel can quickly return to duties at their plants. Courses may cover one or more concentrated subjects, and subjects to be presented can be expanded as the demands of industry appear.

Instructors for the center will include men from industry and educational institutions, as well as the staff of the institute.

Several architects are now preparing proposals for the design of the Training Center building. Construction is planned to start immediately after a design has been approved by the AFS board of directors and the building should be opened for use in early 1958.

The institute's headquarters building, which will house the foundry training activities, will comprise some 17,000 sq ft of floor space, including classrooms, laboratories, offices and a foundry shop laboratory. The latter will be utilized extensively for training activities in melting, molding, coremaking, and pattern shop. Laboratory facilities for sand control, stress analysis, metallography, and x-ray are planned.

Transfer of AFS research activities to the institute does not contemplate any material change either in origination or placement of projects, according to Wm. W. Maloney, AFS general manager. As at present, projects will originate primarily with the AFS divisional research committees, and will be assigned to institutions and facilities best equipped and staged for the investigational work required. All projects will be approved by the institute trustees and on occasions may utilize institute laboratory facilities and personnel.

Educational activities to be conducted as a part of the five-point AFS Institute program will include the AFS Foundry Instructors Seminar. The seminar, first held at Michigan State University last June, will be an integral part of the Institute educational program and is again scheduled at Michigan State in June, 1957. Thereafter, this program for teachers in high schools and vocational schools may be conducted in other areas or at the Institute's own building.

Another point in the AFS Institute program is the expansion of technical field services offered to AFS members. New services to be offered include a series of summer foundry short courses to be offered on college campuses in 1957, and the establishment of regional castings councils. These activities are intended to supplement existing chapter programs and regional conferences. The proposed regional councils are to be held annually in each of the five "regions" of AFS, headed by an AFS regional vice-president, and will be one-week technical sessions "concentrated on limited phases of all cast metals."

Chapter educational activities of the society, and the annual apprentice contest, will continue to function as AFS activities. Advent of the institute will in no way replace or supersede the work of society Divisions and Technical Committees, according to AFS officials.

The final phase of the Institute five-point program is a program of scholarships to be awarded to graduating high school students to encourage enrollments in engineering schools and foundry careers. The program of scholarships is to be organized only when "primary phases of the Institute program are fully established, and as funds become available."

Talking to YOUR Customers

Thirty papers for casting purchasers scheduled for 61st AFS Casting Congress

Foundrymen will tell the designers and buyers who purchase their castings about the latest developments in foundry processes and materials at the 61st Castings Congress and Engineered Castings Show at Cincinnati, May 6-10. Thirty papers designed especially for these interested consumers have already been scheduled.

The Congress theme, "Quality, Utility, Economy of Cast Metals," will be demonstrated as well as discussed in Cincinnati, because many of the developments will be on actual display in the exhibits of the foundries and pattern shops that are reserving booths for the castings show. The assignment of floor space has already started.

Visitors to the 61st Annual Castings Congress and Engineered Castings Show will be housed in 11 major hotels in the neighborhood of the Cincinnati Music Hall where the Congress will be held. The society has announced that all applications for hotel reservations will be considered as of February 15.

For the first time, this Castings Congress will include a program of technical papers and a display of exhibits designed to instruct and advise designers and purchasers of castings. This phase of the Congress is expected to attract both local and national attention to the Congress. The Cincinnati area is a center for machine tool manufacture. A 1952 survey lists 36 machine tool builders in the Cincinnati metropolitan area and over 80 producers of special industry machinery.

Following is a tentative list of papers which will be of interest to designers and buyers. AFS headquarters states that this is not a complete or final list and does not include more than 30 papers of interest principally to foundrymen.

Light Metals Division: Mechanical Properties of 6221 Titanium Alloy, Status of the Art in Titanium Casting, Corrosion of Aluminum Die Castings, Vacuum Die Casting, Die Casting of Magnesium Alloys, Mechanical Properties of Die Casting Alloys, Permanent Mold Casting Practice, Properties of Green Sand and Shell Mold Castings, Test Bar Properties of Light Metals, Properties of Castings and the Effects of Defects in 195 and 355 Alloys, Stress Relief of Sand Castings, Engineered Light Metal Castings (Round Table Luncheon).

Malleable Division: New Foundry Testing Methods, Use of Cobalt 60 in Foundry Applications, Report of Pearlitic Malleable Committee.

Gray Iron Division: Heat Treatment of Cast Iron, Residual Stress in Gray Iron Castings, Microstructure vs Mechanical Properties of Gray Iron, Control of Microstructure and Machinability of Gray Iron, Effect of Shakeout Conditions on Microstructure of Gray Iron Castings, Tin As a Useful Alloy in Gray Iron, Basic Structures as Steps to Quality Casting (Shop Course).

Brass & Bronze Division: Aluminum Alloyed Copper Nickel Alloy, Notch-Ductility of Brass and Bronze, Effect of Geometry on the Properties of Gunmetal and Aluminum Bronze, Casting Difficulties Due to Poor Design (Casting Clinic).

Steel Division: Welding of Steel Castings with CO_2 Gas as a Shielding Agent, Modified Grade "B" Steel, Grain Refinement of Stainless Steel Castings.

Pattern Division: Plastic Patterns.

Assignment of floor space has started for the Engineered Castings Show, the exhibits of foundries and pattern shops who are planning displays to interest the designers who attend the Congress and the technical sessions.

The tentative program for the Congress indicates the arrangement of the technical program. The annual business meeting and the C. E. Hoyt Lecture will be presented on the morning of Wednesday, May 8. A speaker of national prominence in the castings industry will be presented, but his name has not yet been announced.

Plans for tours of plants in the Cincinnati area and arrangements for a ladies program are now being made by the Cincinnati AFS Chapter under the direction of R. J. Westendorf and Edward H. King.

Tentative Program

61st Annual

CASTINGS CONGRESS & ENGINEERED CASTINGS SHOW

Cincinnati, May 6-10, 1957

MONDAY, MAY 6

9:00 am . . . Technical Sessions: Malleable; Pattern; Statistical Quality Control; Steel

12:00 noon . . Steel Luncheon

2:30 pm . . . Technical Session: Sand

4:00 pm . . . Technical Sessions: Fundamental Papers; Management; Safety, Hygiene, and Air Pollution; Sand

8:00 pm . . . Malleable Shop Course

TUESDAY, MAY 7

9:00 am . . . Technical Sessions: Pattern; Safety, Hygiene, and Air Pollution; Statistical Quality Control; Steel

12:00 noon . . Malleable Luncheon; Pattern Luncheon

2:30 pm . . . Technical Sessions: Fundamental Papers; Light Metals; Malleable; Sand

7:00 pm . . . Canadian Dinner; Sand Dinner

8:00 pm . . . Sand Shop Course

WEDNESDAY, MAY 8

9:00 am . . . Annual Business Meeting and C. E. Hoyt Lecture

12:00 noon . . Management Luncheon

2:30 pm . . . Technical Sessions: Education; Gray Iron; Light Metals; Sand

7:00 pm . . . Annual Banquet

THURSDAY, MAY 9

9:00 am . . . Technical Sessions: Brass & Bronze; Gray Iron; Heat Transfer

12:00 noon . . Light Metals Luncheon

2:30 pm . . . Technical Sessions: Brass & Bronze; Education; Industrial Engineering; Light Metals; Sand

7:00 pm . . . Alumni Dinner

8:00 pm . . . Brass & Bronze Shop Course; Gray Iron Shop Course

FRIDAY, MAY 10

9:00 am . . . Brass & Bronze Round Table Breakfast
Technical Sessions: Gray Iron; Heat Transfer

12:00 noon . . Gray Iron Luncheon

2:30 pm . . . Technical Sessions: Brass & Bronze; Industrial Engineering; Light Metals; Sand; Gray Iron Shop Course

ROY MCILRATH /
Roy E. McIlrath Co.

Antifreeze Techniques for CO_2 PROCESS

How to avoid "CO_2 snow" the frost that may ruin your crop of carbon dioxide cores, molds

When the foundryman draws carbon dioxide from a high pressure cylinder and introduces it into a core or mold at low pressure, he has become a potential manufacturer of dry ice. Rapidly expanding CO_2 can become so cold that it freezes itself into "CO_2 snow," basic element of the CO_2 fire extinguisher and a basic cause of difficulties with the CO_2 process.

The two points at which freezing occurs are in the gas cylinders and in the regulator valve. Snow forming at these points can reduce the flow of gas to the core or mold being gassed. Because the properties of cores and molds made by the CO_2 process are greatly dependent on the quantity of gas passed through them, any restrictions in the valve and cylinder resulting from freezing may cause core or mold failure.

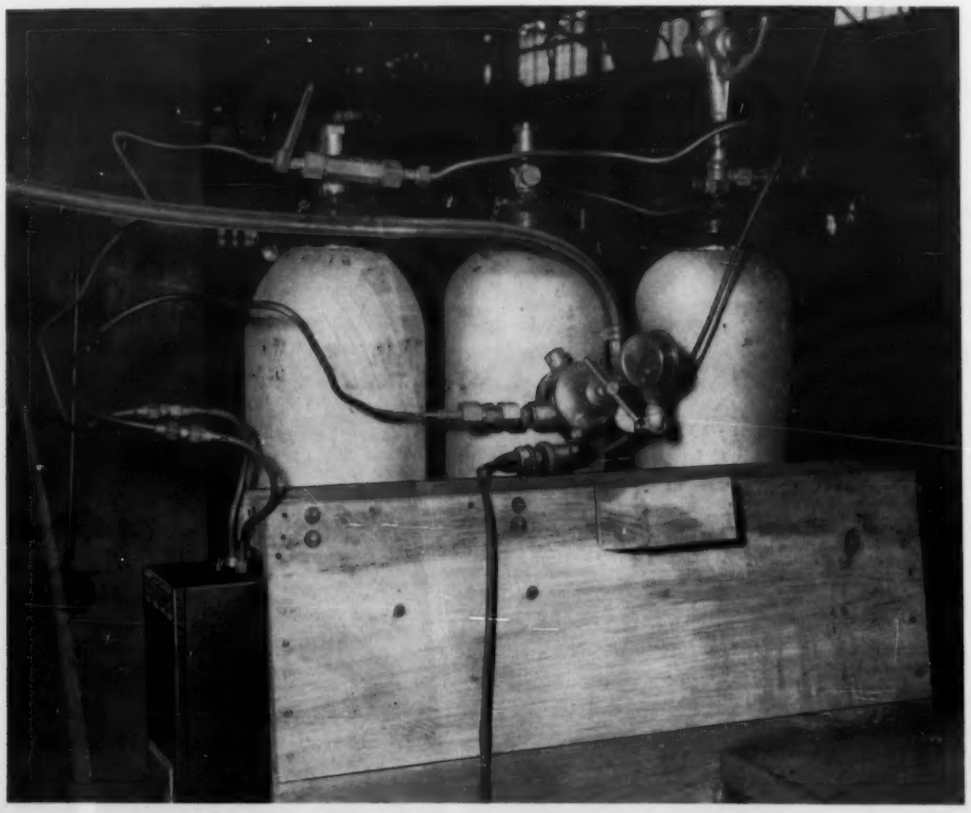
Snow in Cylinders

As heat is removed from CO_2, the gas changes to solid. Releasing gas under pressure into an area of lower pressure sets up a refrigerating cycle as the expanding gas chills its surroundings. If the gas is released from the cylinder too fast, the gas will chill and freeze its surroundings. In this case, the surroundings include the liquid portion of CO_2 in the cylinder. If this CO_2 is frozen, it will not flow into any mold or core.

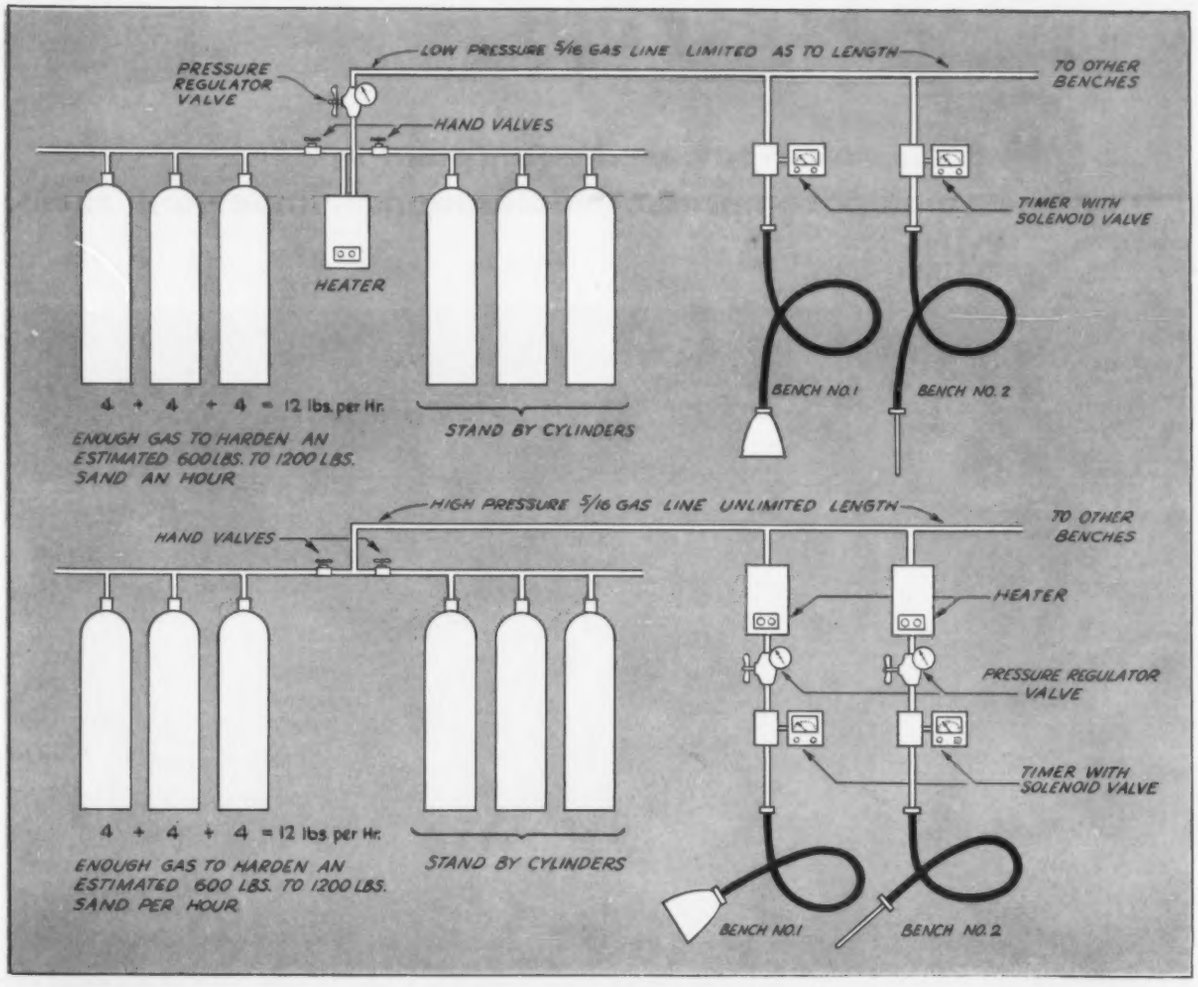
To prevent freezing, four lb/hr (34 cu ft) may be used as a rule-of-thumb limit for the amount of gas that should be removed from a 50 lb cylinder working in a 70 F room. Any higher rate will cause freezing because the room heat will not have a chance to penetrate the cylinder and maintain the liquid above its freezing temperature.

The four-pound limit need not be exceeded if the foundry's requirements have been carefully estimated and tested so that enough cylinders are included in the line to provide the required amount of gas. Sensible planning for the introduction of a CO_2 system should start with an estimate of the amount needed for production. For preliminary estimating, experience indicates that 1 lb of gas will harden 50 to 100 lb of core sand. Using the lower figure, if the foundry desires to treat 600 lb of sand hourly, 12 lb of gas/hr will be required.

Having enough cylinders in the line means that an adequately-sized manifold must be provided in the system. An adequate manifold is necessary to keep the drain on each cylinder within the four-



Freezing occurs when gas released from the pressure vessel sets up refrigeration cycle as its expansion chills surrounding surfaces. Four lb/hr is best gas flow.



Planning starts with an estimate of gas needed, one lb hardens 50 to 100 lbs of core sand. An adequate manifolding system should be provided to maintain operating pressures and an automatic heater may be installed.

pound limit and to provide a stand-by supply of gas.

For stand-by purposes, the use of a manifold at least twice as large as actually needed for the line of working cylinders is recommended. In the case of the foundry treating 600 lb/hr, a manifold accommodating six cylinders is indicated. When the three cylinders needed for proper supply have run dry, three stand-bys can be opened up without interrupting the production schedule.

Snow in the Regulator

The second point in a CO_2 supply line which is affected by the "snow" characteristic is the regulator. The reason for freezing in the regulator is also due to the refrigerating cycle set up when the carbon dioxide gas is released.

The CO_2 in the cylinder is under a pressure of 800 psi, but this is cut down to an emission pressure of around 30 psi by the regulator. The temperature of the gas in the cylinder is about 70 F (room temperature). Therefore, unless something is done, the expanding CO_2 is reduced in temperature at its emission point to around minus 30 F. The inevitable result is that crystals form, accumulate and clog the action of the regulator valve.

The proper way to correct this problem is to provide for heating of the CO_2 between cylinders and regulator, so that the temperature of the gas is raised to a point high enough to prevent freezing.

This heating is best done by means of a small automatic electric heater manufactured for the purpose and installed according to directions at a point between the cylinder line and the regulator. Such a heater raises the temperature of the high pressure gas at 800 psi to 170 F. This results in a temperature high enough to prevent CO_2 snow from forming when gas pressure is reduced to 30 psi.

A 570 watt heater of this type has sufficient capacity to handle approximately 2 lb of gas/minute —the equivalent of 30 cylinders each delivering the recommended 4 lb/hr. Such heaters have been standard for years in bottling plants using CO_2 to carbonate beverages.

Preliminary Testing

Observation of the system during preliminary test operation of the system is vital. It may be found that after the estimated correct number of cylinders, plus the same number of stand-bys, have been set in the line, the electric heater installed, and test operation has started, that frost begins to form at the bottom of the cylinders. This is the sign that the 4 lb/hr rate is being exceeded and that the number of cylinders has been estimated incorrectly. Another cylinder should be added to the system as well as a manifold large enough to cover such possible additions.

Once this preliminary testing has been done, the system is set to operate without further adjustment for as long as the production need for the gas remains unchanged.

These principles of CO_2 planning for the foundry apply to all high pressure systems, whether the gas comes from cylinders or dry ice converters. The only difference is that each high pressure container will have its own capacity.

Methods of preventing snow apply to CO_2 cylinders as well as dry ice converters.

EDMOND C. POWERS /
Compressed Air and Gas Institute

COMPRESSED AIR SYSTEMS

Increasing use of air-powered equipment in foundries makes compressor maintenance important factor

With air powered equipment becoming increasingly popular in foundries, the proper maintenance of compressors, hoses and other allied equipment has become an increasingly important factor in operating costs.

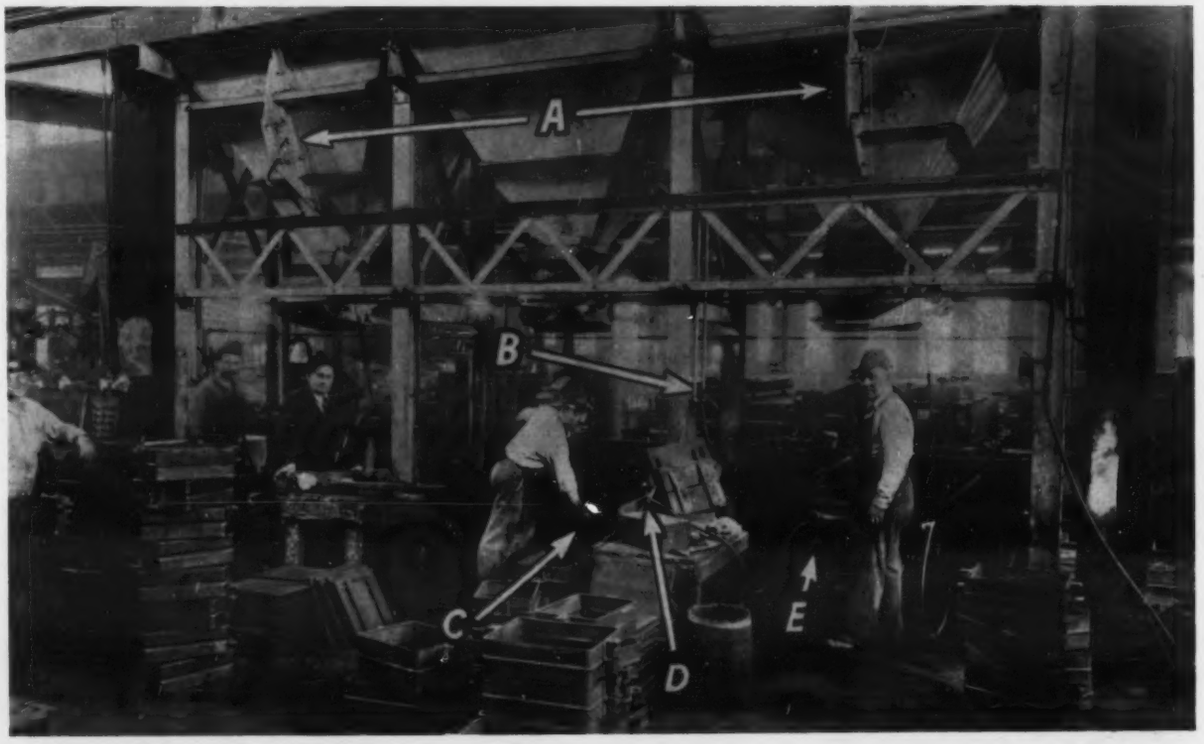
In any plant, where air power is used to a degree, the effective operation of air tools depends upon the performance of the air compressor. Therefore, proper maintenance of the compressor should be understood and its importance accepted.

In most foundries, dirt and grit in the atmosphere are responsible for a large percentage of compressor troubles. Such particles if sucked into a machine cause wear of working parts. Consequently, an air filter should be installed on the intake of the compressor, and cleaned periodically to insure against costly infiltration of dirt.

Six important maintenance factors recommended by the Compressed Air and Gas Institute are contained in this month's Foundry Facts section of MODERN CASTINGS.

Frequently, the lack of a liberal supply of cool water for cylinder jackets, cylinder heads, intercoolers, and aftercoolers, is the cause of temporary shutdown resulting in the loss of valuable man-hours and extensive repair to the machine. This can be avoided by maintaining a liberal supply of cool, clean water in the compressor at all times. The use of dirty water should be avoided as it clogs pasages and reduces cooling efficiency. Where especially cold water is used, it should be introduced into the unit through the intercooler and aftercooler.

A conventional gravity cooling system is not recommended except in the case of portable or temporary installations where a continuous water supply is not available. Cooling water recommended for intercoolers, cylinder jackets, and aftercoolers is shown in the following table.



Compressed air uses with jolt-squeeze machine are (a) air-driven bin vibrator, (b) vibrator valve, (c) squeezer valve, (d) the air vibrator for vibrating pores out of boxes and (e) the knee valve for operating the jolter.

Gallons Water Per 100 Cubic Ft Free Air

Intercooler separate, intercooler and jackets in series, 80-125 psi	2.5-2.8
Two-stage	1.25
Single-stage	1.8
Two-stage jackets alone (both)	0.8
Single-stage jackets:	
40 psi	0.6
60 psi	0.8
80 psi	1.1
100 psi	1.3

Lubrication is another important factor affecting the operation of an air compressor. A suitable lubrication system is included as part of any compressor, and for good results it is necessary to use oil or other lubricants having the particular qualities required for the service intended. Compressor manufacturers specify certain fundamental characteristics of the lubricant for each class of service, such as the viscosity at one or more temperatures, the flash point, the pour point, etc. Compressor operators should in all cases purchase the lubricant to be used from an oil company or dealer willing to guarantee the lubricant as satisfactory for the service for which it is intended. A compressor may require as many as three types of oil, one for the compressor cylinder, another for the crankcase and bearings and the third for the power cylinders.

For compressors of single-acting piston type, the oil must be suitable for both cylinder and crankcase lubrication and must be of the type known as compressor-cylinder oil. For compressors of the double-acting type, in which the cylinders and frame running gear are completely segregated, compressor-cylinder oil must be used for cylinder lubrication, but crankcase oil may be used for the running gear. For steam-engine-driven compressors, oil for the steam cylinders must be of the so-called, steam-cylinder type.

The type of oil best suited for

MAINTENANCE

compressor-cylinder lubrication depends upon such factors as:

1. Ratio of initial and final pressures developed within the cylinders under normal operation.
2. Maximum temperature prevailing in the cylinders under normal operation.
3. Number of stages of compression.
4. Type of cylinder cooling system, such as air-cooled or water-cooled.
5. Type of lubrication system used.
6. Approximate size and speed of the compressor.

To reduce future maintenance costs, a well-refined oil clean and free from suspended matter and water should be used. With multistage compressors, or where the air is extremely moist, as in marine service, it may be desirable to use an oil with a small percentage of compounding. In special cases other factors may be of importance, but all reputable oil companies have developed lubricants suitable for operating under any combination of conditions. They market their products under trade names and are prepared to assume responsibility for the effectiveness of their lubricants. Therefore, they should be given the widest possible latitude as to the physical qualities of the oil for any particular service.

Because of the wide variation of factors influencing the selection of proper lubricating oils, it is possible only to establish the minimum or the maximum permissible limits of general requirements for compressor-cylinder oils, but whatever the case may be, proper lubrication cannot be over stressed if units are to function effectively.

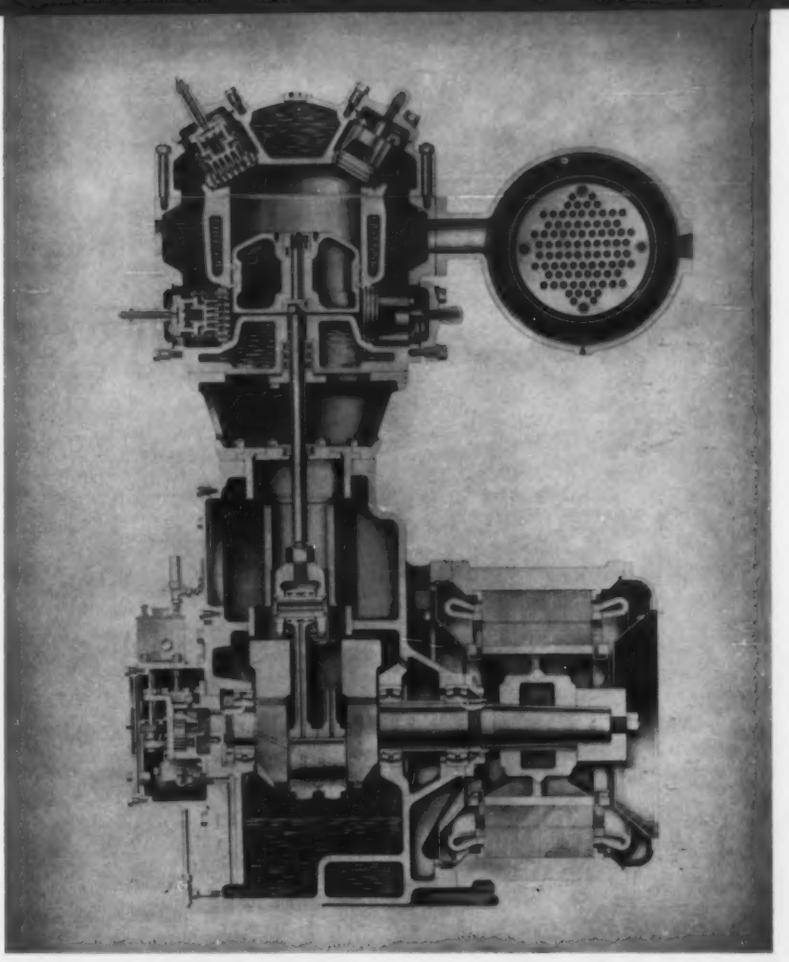
Proper compressor maintenance also embraces six other important factors, as follows:

1. Journal bearings should be carefully examined for evidence of wear. Thrust bearings should be checked for axial position, condition of adjustment shims, and also evidence of wear.
2. Couplings should be thoroughly cleaned and examined periodically for evidence of wear. If the coupling is in a questionable condition, it should be replaced immediately. When replacing a gear type coupling, both halves should be replaced.
3. Compressor casings should be given a rigid inspection periodically to guard against corrosion, erosion and fouling. At the same time all other stationary parts should be inspected.
4. The compressor rotor should also be examined for evidence of corrosion, erosion and fouling. Rotor condition should be recorded and clearances checked.
5. The turbine motor should be examined carefully and a record of its condition noted. Necessary repairs should be made before trouble sets in. During this check, air ducts and windings should be cleaned, condition of the insulation should be noted and a check and record of the air gap made.
6. Protective devices should be checked frequently to insure against failure and the operation of the auxiliary oil pump should be carefully observed.

It is important to note that in any foundry set up, preventive maintenance is the most practical way of eliminating costly downtime and reducing overall maintenance costs.

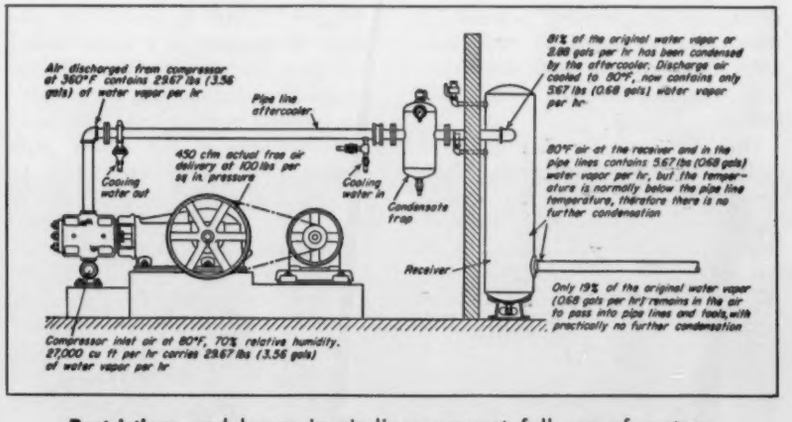
Competent personnel also goes a long way. A little visual observation, knowledge and interest on the part of compressor operators means a lot in keeping maintenance costs to a minimum.

In line with special compressor maintenance considerations are the factors governing the proper maintenance of hoses, air lines and sundry equipment. In many plants proper maintenance of these items



Dirt and grit are responsible for much compressor trouble, air filters should be installed on intake, cleaned periodically for best results.

is neglected with the result that relatively few plants are utilizing the full power discharged from the air compressor. In many cases, losses and restrictions in air distribution systems resulting in low air pressure at the tool as high as 30 to 50 per cent. Such reduction of air power has a drastic effect upon production and should be corrected. Increasing the air pressure from 70 to 90 psi increases the available power for the average tool by about 37 per cent.



Restrictions and losses in air lines prevent full use of system.

A NEW IDEA— WARM BLAST CUPOLAS

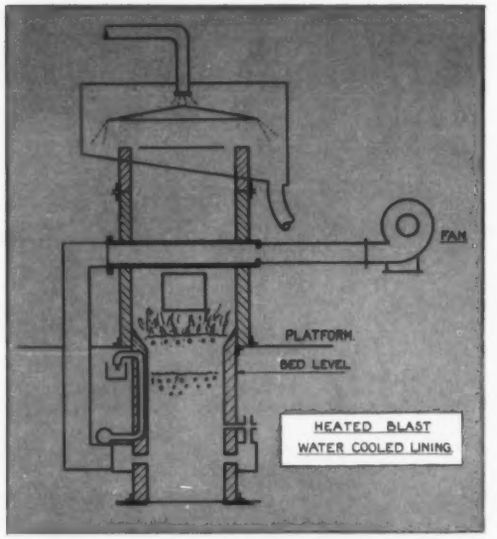
WM. Y. BUCHANAN /
John Lang & Sons, Ltd.
Johnstone, England

English foundry achieves benefits of recuperative hot blast with modest-cost heating chamber

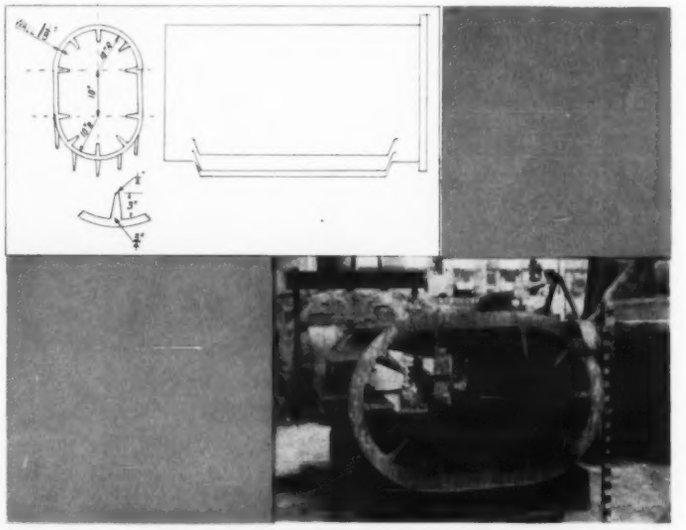
Many are the virtues that are claimed for cupolas using a preheated or "hot" blast: fuel economy of 20 to 25 per cent and/or faster melting, better cupola operation, and better control of metal. At John Lang & Sons, Ltd. we have found that we can obtain many of these results with a system that is "warm," not hot.

In this warm blast system, the recuperator increases the temperature of the blast only 130 F (56 C) rather than the 400 to 800 F possible with a recuperative hot blast system. However, all the benefits associated with hot blast are obtained to a lesser, but none the less significant degree.

There is also a new, and significant, claim to be made for the "warm" system: its modest cost. The equipment for the system was designed and built in our plant and we expect it to have a long service life.



Simply constructed, the system promises years of cheaper and better production.



Internal and external fins on cast iron recuperator were designed by John Lang to increase effectiveness.

There is a great variety of examples of cast iron or steel recuperators in the literature of our industry, many of them set in the stack to catch the flame usually present during working. That these have not become popular is perhaps due to the effort to obtain too high an air temperature. This effort led to designing recuperative systems in which the over-heated chambers were rapidly destroyed. Our system was designed to avoid this pitfall.

One of the reasons that we started our study of a conditioned blast system was the availability of low quality coke in Europe. It was felt that better use could be made of this coke, with its high sulphur and ash content, if a conditioned blast were used.

Our melting is done in a 32 in. cupola which was specially designed for melting cast iron borings. Our experiences in melting borings were published in *American Foundryman* (MODERN CASTINGS), May 1954, but the present warm blast development is a new and separate accomplishment, not limited to melting borings. It has been applied to standard cupolas with success.

The warm blast system has been designed to be as simple as possible. It consists of a thick-walled cast iron heating chamber with internal longitudinal fins to increase the internal surface area. The cross sectional area of this heater pipe was only increased sufficiently to reduce the velocity of air by 50 per cent, thus, the air passing through the heater still has a velocity of about 88 ft/sec, and the cast iron is prevented from rising to a red heat with the corresponding increase in the life of the pipe.

With a hot blast of around 900 F (500 C), refractory lining of the air ducts is necessary with its corresponding high cost whereas with a system of this type, square sheet iron ducts lined inside with 5/8 in. soft asbestos board are quite successful and very cheap.

The results obtained from the warm blast were:

1. The tuyeres remained free from slag all day, where previously they had to be cleared after a three hour run.
2. The tapping temperature increased.
3. The slag and metal ran continuously.
4. The lining was much cleaner after the drop. Normally the tuyeres were coated with slag, now these are the cleanest part of the lining.
5. There was no excessive increase in the temperature of the air pipe during blowing down and no adhering slag.
6. The slag volume was considerably reduced, showing less oxidation.

Readings taken from 10 heats before and after the installation of the air heater show an increase in melting rate of 6.4 per cent even with a higher percentage of cast iron borings in the charge.

Average analysis before and after are as follows:

	Cold blast	Warm blast
TC	2.14	2.29
Si	1.00	1.48
S	0.16	0.15
P	0.68	0.30
Mn	0.40	0.36

These analysis figures tend to show an increase in carbon and silicon, indicating less oxidation. The improved melting rate, freedom from slag at the tuyeres, higher tapping temperatures, cleaner furnace, are sufficient to justify the application of warm blast.

These findings have been verified on a standard foundry cupola with even lower air blast temperatures.

Pull the staple to remove the calendar.

Modern Castings Bonus Supplement 1957

JANUARY

A MODERN CASTINGS Bonus. The first 18 Bonus Sections that appeared in MODERN CASTINGS shared two important characteristics: they presented practical information and were of immediate value to foundrymen. These same characteristics are incorporated in this 1957 Bonus Calendar. The bonus in the design of the calendar is the space reserved for its owner's private reminders. And what could be more important to the foundryman than to be reminded of the activities of the American Foundrymen's Society?

The 12 months recorded by this calendar will find more practical information in MODERN CASTINGS, and a Happy New Year!

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1957 FEBRUARY

AFS Technical Activities: backbone of the technical activities is the 111 committees composed of more than 600 members from all branches of the industry.

The committees are responsible for conducting fundamental and applied research, preparing publications, developing convention programs and consulting with the AFS staff. Also for presenting talks before chapters, annual meetings and regional conferences, conducting castings clinics and short courses, answering technical inquiries and performing liason work with other technical societies.

These activities are headed by AFS's technical director. The technical committees are divided into committees of the board, the technical council, 10 general interest committees and eight basic divisions including brass and bronze, education, gray iron, light metals, malleable, pattern, and sand and steel classifications.

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1957 MARCH

Chapter Activities: local chapters represent the strength of the AFS organization. The success of the society depends upon active participation at the local level. In addition to dealing with foundry problems, members also derive fellowship and personal contact with other foundrymen through meetings, plant visits and social activities.

There are now 46 chapters in the United States Canada and Mexico. Membership has been growing steadily, now nearly 13,000, a new society record.

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1957 APRIL

Convention Papers: dissemination of information to advance the castings industry is the basic purpose of the society. About 65 papers will be presented at the 61st Castings Congress and First Engineered Castings Show to be held May 6-10 at Cincinnati.

During the five-day meeting, papers will be presented for each of the technical divisions, brass and bronze, gray iron, light metals, malleable iron, steel, patternmaking, education and sand.

General interest papers will also be given, such as fundamental papers; management techniques; safety, hygiene and air pollution; plant and plant equipment; and industrial engineering and costs. The theme of the show will be casting quality, utility and economy.

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1957 MAY

Shows and Exhibits: Cincinnati will be the site of the 61st AFS Castings Congress combined with the First Engineered Castings Show held May 6-10 at the Cincinnati Music Hall.

This year the show will be directed toward a special audience, the designers and purchasers of castings. Exhibitors will be producers of castings for sale, manufacturers of laboratory and testing equipment for product control, suppliers of metals and alloys for melting, and companies producing castings for sale.

Manufacturing processes will include sand castings, shell molding, permanent molding, precision molding, die casting, centrifugal castings and other techniques used commercially in the U.S. Supplementing this will be the technical papers aimed at casting designers.

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1957 JUNE

Gold Medals: The American Foundrymen's Society recognizes accomplishment in the industry with its six gold medals. The six and their qualifications:

Wm. H. McFadden:
"For contributions to the Society and for valuable service over many years."

Peter L. Simpson:
"For the annual lecture or promoting public esteem of the industry, or service reflecting credit."

John H. Whiting:
"For . . noteworthy contribution in melting of metals in the cupola or air furnace."

Joseph S. Seaman:
"For a paper . . some development of a process, or invention of a . . device."

John A. Penton:
"For . . noteworthy contribution to . . electric furnace practice in melting."

Thos. W. Pangborn:
"For . . contributions particularly in . . education for foundry careers."

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1957 JULY

AFS Educational Activities: include in-plant training as well as secondary schools. It sponsors the Robert E. Kennedy Memorial Apprentice contest which is operated on both a chapter and plant basis.

The Foundry Instructors Seminar provides a link between education and the castings industry. A three-day seminar is conducted for instructors in foundry and patternmaking on the secondary level.

Education division committees develop outlines and text material for use by industrial arts teachers. In-plant training is offered in the form of foreman training guides and apprentice training outlines. Committees plan activities for chapter education in the form of short courses and programs and offer educational services and assistance to the society membership.

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1957 AUGUST

TRANSACTIONS: published annually by AFS, contains technical papers presented at the annual convention as well as reports on society activities.

The 1956 edition of TRANSACTIONS is volume 64 in a series whose pages record both the growth of AFS's international organization and the developing scientific maturity of great and basic metal working industry.

The first volume was published in 1896 and the publication was called a "Journal." Not until 1904 was the title "Transactions" adopted.

Such a wealth of information is contained in the 1956 book that nearly 800 pages are required to present the almost 100 technical papers.

The 1956 TRANSACTIONS contains information on the CO_2 process for hardening molds and cores, shell molding, core blowing foundry sand practice, hot-blast cupola operations as well as articles on aluminum, steel, gray iron, malleable iron and brass and bronze.

In addition to technical articles and exchange papers, TRANSACTIONS covers AFS research projects and meetings of the board.

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1957 SEPTEMBER

AFS Library: now has approximately 1700 books on foundries and related subjects. New books are added at the rate of 10 monthly. Over 130 periodicals are received each month.

In addition to answering questions for staff members, the library serves as a source of information for members of the society and other technical libraries. Photocopy equipment is available so that copies of material may be provided rapidly and inexpensively. The librarian also complies the biblioraphies.

Clippings and other subject matter too small to handle conveniently are organized into subject files and form an important part of up-to-date information.

In addition to current publications, the library also has books of historical interest which indicate the growth of the industry since the formation of AFS in 1896.

The establishment of the Foundry Training Center in Des Plaines by AFS forecasts growth for the AFS library.

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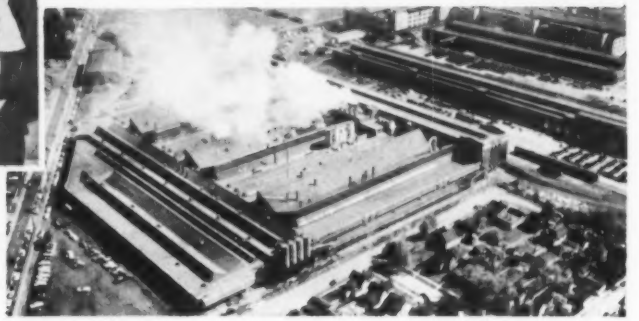
Safety, Health and Air Pollution: an aggressive campaign is constantly conducted by AFS through its SH&AP committee. Two manuals, ***Engineering Manual for Control of In-Plant Environment*** and ***Foundry Air Pollution*** have been published recently. The revision of ***Safe Practices Manual for Protection of Workers in Foundries*** and ***Safe Practices Manual for Welding, Cutting and Soldering*** have been completed. Currently two publications, ***Foundry Noise Manual*** and ***Radiation Protection Manual*** are being prepared.

In addition to publications, the SH&AP activities include participation with other technical societies. In this manner the latest information is forwarded to members. Assistance is given to member foundries and special surveys are conducted for peculiar air pollution problems. Chapters are also visited and assisted with local and state legislation.



1957 OCTOBER

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1957 NOVEMBER

Regional Conferences: bridge local and national AFS activities. They allow for more elaborate programs than financially possible on the chapter level. Outstanding speakers are obtained and many of the best technical papers originate at this level. These conferences also allow for discussion of problems encountered in various sections but all include technical sessions on basic casting problems with all branches of the industry represented.

Regional conferences held 1956-57 were Northwest Regional, New England Regional, Purdue Metal Castings Conference, All-Canadian Regional, Michigan Regional, Wisconsin Regional, Southeastern Regional, California Regional, East Coast Regional and Penn State Regional. Location of these conferences is usually shifted between the sponsoring AFS chapters.

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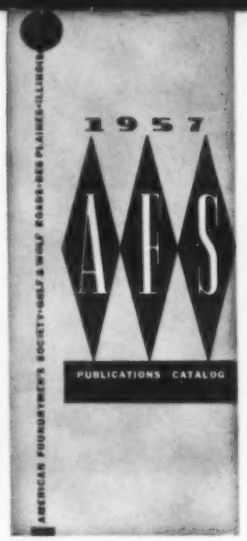
AFS Book Department: publishes and distributes more than 50 books, manuals, symposiums and research reports pertaining to the castings industry. Publications are prepared by authorities and cover all phases of foundry operations and techniques.

During the year ending October 31, 1956, more than 14,000 copies were distributed by the book department. Leading sellers were ***Principles of Metal Casting, The Cupola and Its Operation,*** the new ***Engineering Manual for Control of In-Plant Environment*** and ***Glossary of Foundry Terms.***

TRANSACTIONS is prepared annually and various handbooks and manuals are constantly revised. The ***Cast Metals Handbook*** is in its fourth edition and includes the latest authoritative information for engineers, designers and users of castings. This fundamental book has been completely revised.



1957 DECEMBER

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KRESGE AUDITORIUM HEADQUARTERS FOR NEW ENGLAND MEETING

Casting problems and techniques with emphasis on small foundries were presented at the 16th New England Regional foundry conference. Sessions were divided between ferrous and non-ferrous conferences. More than 500 foundrymen attended the meeting held October 19-20 at Kresge Auditorium, Massachusetts Institute of Technology, Cambridge, Mass.

Conference chairman was Howard B. Nye, Marlborough Foundry Inc.; vice-chairman was Albert M. Nutter, E. L. LeBaron Foundry Co.; ferrous program chairmen were James B. Robinson, United Shoe Machinery Corp., and Harry K. Sleicher, Seaboard Foundry, Inc.; non-ferrous vice-chairman were Stafford W. Chappell, Electric Boat Div. General Dynamics Corp. and Julius Ferrari, Gorham Mfg. Co.

The conference was opened Friday morning by Chairman Nye with an address of welcome given by C. Richard Soderberg, Dean of Engineering, M.I.T.

"Cupola Operation" by Harry Kessler, Sorbo Mat Process Engineers, St. Louis, Mo. Started the ferrous technical session while the non-ferrous session was opened by Robert J. Maddison who presented "Mold Behavior," an illustrated lecture. He stated that during the pouring of the mold a variety of changes occur. They are interdependent and occur in a time sequence, he said and pointed out that one action brings another into play and shortly the overall operation becomes very complex—particularly in view of the fact that the entire cycle occurs in approximately 5 to 10 minutes with temperatures varying from room temperature to elevated temperatures.

Friday afternoon's session started with "Gating and Risering" by Ray Cochran, R. Lavin & Sons, Inc. for the non-ferrous session while Roger B. Sinclair presented "Improving Foundry Layout" to the ferrous section. Sinclair said that foundries must look to good layout for four reasons, to reduce labor requirements, to keep material handling costs to a minimum, to keep operations flexible and to keep operations economical with expansion and growth.

Sinclair pointed out that all layout whether for the entire foundry or a single work station hinges on two factors; the flow of material and product through the section under study and the order of all items within the sections under study. He concluded by bringing out that in addition to the efficiency gained by layout study there must be included the continuous improvement of operating facilities in line with product changes and advancements in methods.

A talk on "Of Money and Men" was given to a joint session by Dr. Neil Carothers, economic consultant. This was followed by a social hour and a conference dinner at which Bill Summers, American League umpire, was the speaker.

Saturday's activities began with simultaneous talks, "Ductile Iron—Unvarnished" by Arthur A. Avedisian, The Taylor and Fenn Co., Windsor, Conn. and "Quality Control in the Small Foundry" by Clarence Lyons, Gorham Manufacturing Co., Providence, R. I.

Avedisian presented an extemporaneous talk stating that a thorough analysis of the ductile iron industry requires both the evaluation of the metal as an engineering material and its inherent problems of manufacture. He said that ductile iron has been publicized a great deal but little had been said about the difficulties of producing it. The speaker emphasized that strict control of every step in the production of ductile iron would do much to eliminate the production difficulties.

Lyons began his talk by distinguishing between quality control and inspection. The latter he said is merely a sorting operation, weeding out the bad pieces from the good and separating these pieces into two classes, scrap and those which may be further processed.

Lyons listed the basic principles of quality control as: know exactly what you are supposed to do, know exactly how you are going to do it, know exactly what you are doing, instruct accordingly and supervise accordingly.

Activities in the non-ferrous divisions continued with "What the Small Foundry Should Know About Heat Treating" by Robert Sheldon, Springfield, Bronze & Aluminum Co., Springfield, Mass.

In the ferrous division a castings defects analysis panel was held with Alexander Beck, Whitman Foundry, Inc., Whitman, Mass. acting as moderator. Participants were Arthur Enquist, The Connecticut Foundry Co., Rocky Hill, Conn., Lou Greenslade, Brown & Sharpe Mfg. Co., Providence, R. I., Bob Walker Whitin Machine Works, Whitinsville, Mass., Don Sawtelle, Malleable Iron Fittings Co., Branford, Conn., Ahti Erkkinen, Fremont Casting Co., Worcester, Mass., James Stringfellow, Draper Corp., Hopedale, Mass., Lou Iadorola, Pioneer Foundry & Mfg. Co., Gilbertville, Mass. and Jack Healy, Producto Machine Co., Bridgeport, Conn.

"Cast Iron Metallurgy Can Be Understood" by Charles C. Reynolds, assistant professor, M.I.T., concluded the ferrous sessions. A discussion of the CO_2 process by A. B. Steck, General Electric Co., ended the non-ferrous activities.

Chairman Howard Nye presided at 16th regional conference.

The conference was concluded by a joint session. "The Foundry is a Good Place To Work" was given by Oscar H. Kraft, Westover Corp., Milwaukee.

Committee members in addition to the chairmen were Clyde Armstrong, Alexander Beck, Joseph Burke, Thomas I. Curtin, Jr., Ahti Erkkinen; Romeo Lemoine, William Hale, James Hamblin, Fred Holway, Charles W. Hutchins, Warren Murdock, William Naughton, William Ohlson, Daniel Pendergast, Harold E. Prindle, C. P. Randall, Phillip C. Smith, Prof. Howard E. Taylor, Alexander S. Wright, and C. A. Wyatt.

Dinner speaker was Bill Summers, American league umpire, shown with Professor Howard Taylor, chairman of banquet.

Conference activities attracted more than 500 foundrymen from northeastern section.

PURDUE CONFERENCE

STRESSED MEETING CUSTOMER DEMAND

Meeting the customer's demands, now and in the future, is the casting industry's most important problem. This was the theme of the 9th annual Metals Castings Conference held at Purdue University, West Lafayette, Ind., October 25-26.

The program was conducted in the Memorial Union building and sponsored by the Michiana and Central Indiana chapters of the American Foundrymen's Society and Purdue's School of Chemical and Metallurgical Engineering and the Division of Adult Education.

R. R. Greenlee, Auto Specialties Manufacturing Co., St. Joseph, Mich., was the conference chairman while C. O. Schopp, Link-Belt Co., Indianapolis was program chairman.

The conference was opened by R. Schuhmann, School of Chemical and Metallurgical Engineering, and morning conference chairman. A welcome was presented by G. A. Hawkins, dean of the Schools of Engineering.

C. V. Nass, Beardsley & Piper, Chicago, presented industry's response. He observed that "our foundry industry is rapidly undergoing a change from that of an art to an industry of science. As we all know, tremendous progress has been made in the last decade. These advances, dictated by the customers' demands, could not have been accomplished without the help of technically trained men—in many cases, men just recently drawn into the foundry industry.

"Thanks to these technically trained men, now within the ranks of the foundry industry, for the recent progress in this development of new processes and new methods—more rapid progress than ever before.

We must be cognizant of the fact that we not only have the direct competition from other industries for our market, but we have extremely serious competition in respect to manpower which will either permit us to continue, or prevent us from the building, expanding, and improving of our industry.

While we stress the need for engineering in our industry, we must not lose sight of the fact that we need better trained skill in all levels of foundry supervision."

"Customer Demands and Future Markets" was discussed by Collins L. Carter, Albion Malleable Iron Co., Albion, Mich. who stated "Each development in one segment of the foundry industry impinges, either directly or potentially, on the markets of another and causes intensified activity toward improvement in process and product within the foundry industry. As a result, the user has basis for increased demands which he naturally uses.

He said that by projecting the average rate of increase in casting shipments during the past decade, that by 1976 the industry would be producing 26 millions tons or twice that of 1949. He emphasized that this prediction would be true only if production meets the customer demands.

"We are in an era of great change when it comes to cusomer specifications. Not only are our customers interested in the physical characteristics of the given metal but the machinability of that metal and the ability to hold dimensional accuracy —last, but most important, our customers are interested in the final cost of the casting after it has been processed."

AFS President Frank W. Shipley, Caterpillar Tractor Co., spoke on the 1st Engineered Castings Show to be held May 6-10, 1957 at Cincinnati. He said that the show will be directed to purchasing agents and designers, pointing out the advantages of castings and demonstrating their adaptability.

Floyd Crowley, Benton Harbor Malleable Iron Co., Benton Harbor, Mich., was chairman of the opening afternoon session. William Ball, Jr., R. Lavin Co., Chicago, spoke on the effect of design on making castings. He stressed that designing is actually a complete picture of the product including its application.

R. H. Brookes, Link Belt Co., Indianapolis, was chairman of the second session and introduced B. C. Yearley, National Malleable & Steel Castings Co., who presented *"Meeting the Customers' Requirements."* He stressed the advantages of castings which include the ability to produce a difficult design, similar physical properties in all directions, granting designers more freedom in selecting where they want to put the metal, low tooling costs and the ability to produce a definite shape from scrap or pig iron.

Friday's activities were opened by Robert Hull, Castings Service Corp., LaPorte, Ind., serving as chairman. The speaker was J. S. Schumacher, Hill Griffith Co., Cincinnati, who spoke on *"Concerning Sand."* He explained that good sand control results from correlated statistics and emphasized that to achieve good sand control that laboratory tests should be made under conditions similar to those of actual production. With proper control, green sand molding can do a better job than shell molding, he said.

A panel discussion was held on shell molding, participants were Richard G. Wiest, Dalton Foundries, Warsaw, Ind., chairman; Ladd C. Shramek, Bendix Aviation, Lake Shore Div., St. Joseph, Mich.; Victor A. Baldwin, Sibley Machine & Foundry Corp., South Bend, Ind.; C. O. Schopp; and T. E. Smith, Central Foundry Div., G.M.C., Danville, Ill.

Dallas Lunsford, Perfect Circle Corp., Hagerstown, Ind., was chairman of the final session. Ed Oakley, Delco Remy Div., G.M.C., Anderson, Ind., discussed *"Can Casting Quality Be Improved?"* He used a pin ball demonstration to prove the laws of variation, basic to quality control.

The conference summary was conducted by C. T. Marek, Professor of Metal Processing, Purdue University and Conference Chairman R. R. Greenlee.

In addition to Greenlee, Schopp and Marek, the conference committee was composed of W. E. Patterson, assistant program chairman, Elkhart Foundry & Machine Co., Elkhart, Ind.; James C. Maggart, Sibley Machine and Foundry Corp., South Bend, Ind.; Victor J. Obrig, Fabricast Division, Bedford, Ind.; T. E. Smith; Dallas Lunsford, Perfect Circle Corp., Hagerstown, Ind.; H. B. Voorhees, Buckeye Products Co., Cincinnati; R. W. Lindley, R. Schuhmann, Jr.; and K. E. Glancy, conference supervisor, division of Adult Education, Purdue University.

Program chairman Schoop, AFS President Frank Shipley, discuss meeting with Prof Marek, chairman Greenlee.

Speaker Schumacher and chairman Robert Hull prepare to open Friday's technical session.

NORTHWEST REGIONAL
FEATURES LOCAL SPEAKERS

NORMAN E. HALL / *Electric Steel Foundry Co., Portland, Ore.*

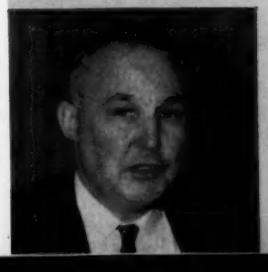
JOHN BERMINGHAM / *E. F. Houghton & Co.*

FRANK FRINK, JR. / *Washington Iron Works*

DOMINIC COCCIONE / *Washington Iron Works*

ED. J. MCAFEE / *Puget Sound Naval Yard*

HAROLD HENDERSON /



Current and future foundry developments in the Pacific Northwest, presented by foundrymen from that section, were the highlights of the 7th annual Northwest Regional Conference held Oct. 19-20 at the Benjamin Franklin Hotel, Seattle, Wash.

Two hundred and thirty foundrymen and their wives attended the conference sponsored by the Washington, Oregon and British Columbia chapters of the American Foundrymen's Society and the Oregon State College student chapter. Fred R. Young, E. A. Wilcox & Co., was the general chairman.

The conference was opened by Vern Rowe, Ballard Pattern & Brass Foundry, morning technical chairman. He introduced John Bermingham, E. F. Houghton & Co., who spoke on *"Core Binders & Core Making."* Bermingham listed the common bonding agents in baked cores as oils, resins and compounded additives and stated that the qualities of these has been consistently improved during the past 10 years. He emphasized that the success of binding procedures and mixtures varies considerably in different foundries due to changes in baking times, temperatures and ventilation.

Dominic Coccione, Washington Iron Works, talked on *"Gating for Pressure Casting"* and *"Economical Molding Practice."* During his 49 years in the foundry industry he said that the greatest advances in casting design was the consideration of all factors from the initial drawing to its actual application. He also spoke on his development of a system of top pencil gating for liners, chests and many other pressure castings and, later to the development of a variation of this system for gating heavy steel castings weighing up to 40,000 lbs.

His primary goal for all of these castings was to pour them as rapidly as possible to keep the scum and skin from rising into the casting, Coccione stated. This, he said, produced a uniform temperature of metal through the mold with a desirable temperature gradient from the bottom of the casting to the riser. This latter condition is especially enhanced by top pouring.

Coccione said that today those responsible for casting design share the responsibility with foundrymen for good castings, declaring the best gating and risering set-up will not produce good castings if the design is bad. Recalling his early experience with castings for steam operated heavy logging machinery, the speaker pointed out the tendency of early designers to incorporate too many heavy sections without regard to real need.

Two speakers were featured at the Friday luncheon, Herbert Heaton, Letson & Burpee Ltd., Vancouver, AFS Regional Director, and Frank Frink, Jr., Washington Iron Works. A plant tour of Washington Iron Works concluded the afternoon's activities.

Toastmaster of the Friday banquet was Prof. Gilbert Schaller, University of Washington, who told of his foundry visits during a trip to Europe. Banquet speaker was C. N. Key, public information supervisor of the Pacific Telephone and Telegraph Co., who spoke on the subject "Sun and Sand." Key gave a demonstration of the telephone company's research and experiments in the development of the solar battery. He pointed out that the solar battery has been developed and that with further research it is possible that this power source may be developed for commercial production in the near future.

Saturday's program was opened by Wm. L. Mackey, Washington Stove Works, technical chairman. First of three morning speakers was Harold E. Henderson, H. C. Macaulay Foundry Co., who discussed *"Sand Practice"* pointing out that sand has been the last important foundry material to receive technical study. *"Casting Design—Drawing Board to Product,"* was presented by Prof. W. A. Snyder, University of Washington, who outlined the three basic principles of design as the part to be made, the material to be used and the part to be designed.

The morning's activities were concluded by Jonathon Marden, Eutetic Welding Alloys Corp., who covered the three fundamental uses of welding in foundries, maintenance, fabrication and repair. He discussed some of the new advances in welding practice, including preparation of rods, cutting rods, and non-fusing low eutectin rods. Following his talk, Marden showed a film illustrating modern foundry methods and uses of welding.

Luncheon speaker Harvey Buffum, manufacturing research section, Boeing Airplane Co., discussed the high temperatures encountered in the development of airplanes traveling at speeds up to Mach 2. He stated that Boeing now has 200 engineers working on the development and utilization of temperature resistant alloys.

William K. Gibb, Atlas Foundry & Machine Co., was chairman of the afternoon technical session. S. C. Massari, AFS technical director, spoke on *"Marketing Your Product"* warning that customer requirements must be met or the business will be lost to competitive methods.

The final speaker was Ed. J. McAfee, Puget Sound Naval Shipyard, who discussed *"Use of Epoxy Resins as a Pattern Material,"* covering two and a half years experience with these resins. Epoxy resin patterns have proved to be tough, stable and less expensive than aluminum patterns, he said. He added that the two most successful manufacturing methods have been casting in sections 3/8 in. or less and using glass cloth with resin saturation. He noted that in many cases old master patterns can be of value in making less expensive plastic patterns.

Committee members in addition to General Chairman Young were: program, James N. Wessel, and William K. Gibb. Publicity, Frank H. Jefferson, Jack Reardon, Norman E. Hall, and Lovic P. Young.

Reception, James D. Tracy, William L. Mackey and R. G. Prichard. Finance, J. F. Dolansky, Vernon W. Rowe, and William A. Shaug.

Plant visitations, Leon Morel, Domonic Coccione and William G. Rawson.

Housing and accommodations, J. V. Reardon, and Carl P. Irwin.

Registration, Robert H. Barnes, H. E. Hartley, and Alvin T. Zandt.

Entertainment, Jack Uren, Jack Peterson, and F. Jefferson.

Ladies program, Mrs. J. V. Reardon.

GEORGE A. MOTT
Assistant Editor

ALL CANADIAN CONFERENCE

HIGHLIGHTS EPOXY RESINS

Technical papers and plant tours were the highlights of the 6th All Canadian Conference held November 8-9 at Montreal. The conference was sponsored by the Eastern Canada and Ontario chapters of the American Foundrymen's Society and held at the Sheraton Mount Royal Hotel. It was attended by 335 foundrymen from Canada and the United States.

Plant tours opened the program Thursday morning. Foundries visited were Montreal Bronze Ltd., Warden King Limited, Dominion Engineering Works Ltd., and Canadian Steel Foundries (1956) Ltd.

Delegates returned to the hotel for an inaugural luncheon and an address by AFS President Frank W. Shipley, Caterpillar Tractor Co., Peoria, Ill. Shipley told of the Canadian contributions to the Society and complimented Alex Pirrie and Herbert Heaton for their work as national directors. Shipley discussed future AFS plans and outlined the present activities of the Society. He stressed the need for education in the foundry industry, particularly in secondary schools and at the plant level.

Wm. Dunn, Western Pattern Works, Montreal, and past chairman of the Eastern Canada chapter, served as technical chairman of the opening session. Walter E. Wenninga, Waldor Enterprises Ltd., Montreal, presented *"Plastics for the Foundry Industry."* He traced the progress of plastics starting in the 1930's through the use of phenolics, polyesters and to epoxy resins currently used.

Wenninga stated that the advantages of epoxy resins over metal patterns and core boxes included dimensional stability, high compressive strength, excellent adhesive qualities, impact resistance, wetting ability, chemical resistance, high flexural strength, high abrasion resistance, easy release from molding sands and reduced weight. An investment of only $250 is needed to begin actual operations, Wennenga pointed out.

The speaker warned that care must be taken in mixing the resin, which is either liquid or semi-liquid. Both the resin and the catalyst must be mixed in proper proportions to avoid pin holes and improper curing. The pot life of resins varies from 30 min to two hours so that only small quantities should be compounded at one time. Other precautions to observe in obtaining the best results include clean and smooth surfaces, highly polished molds, dry plaster molds and avoiding air pockets.

Epoxy resins have been the answer to all the shortcomings of the previously used thermosetting resins, Wenninga emphasized. He continued, saying that it is now possible to produce accurate tools in a fraction of the time required using other materials, with consequent substantial cost savings.

"Plastic pattern and core box equipment passed very rapidly through the development stages and the advantages of this method of tooling have been thoroughly evaluated under service conditions. In Canada the use of plastic tools, particularly in the foundry industry, is now solidly backed by a service record of more than four years."

Wenninga said that advantages of epoxies in tooling are that it will cure or harden without the formation of by products, enabling the production of bubble-free castings. Its shrinkage during curing is extremely low to the extent that if properly handled, it becomes negligible. It has high mechanical strength, good water and chemical resistance and is easy to use with normal shop equipment.

One condition which must be considered in handling epoxy resins is their natural bond to most clean surfaces including metals, Wenninga stated. "This is very desirable when they are used as coatings or adhesives, but when a resin is to be poured into a mold from which it must later be removed, it necessitates the use of a mold release agent. There are various types of these, the most commonly used one being a liquid film-forming type which may be either painted on or sprayed. Both the liquid and the film which it forms are water soluble, which facilitates the cleaning of brushes or spray equipment and the removal of the film from the finished tool.

"As the mold release is of very low viscosity, any porous surface such as wood or plaster must first be sealed with a suitable sealer. By applying coats of special sanding sealer, which has been developed for this purpose, and sanding in between coats with very fine sandpaper, an extremely smooth finish may be obtained even on plaster molds. Final assurance of a perfect mold release is obtained by the use of a hard polishing wax, one coat being applied and polished under the mold release film and one on top."

The speaker concluded by stating the plastic tooling industry is young and that in the few years during which it has been developed, tremendous strides have been made. He forecasted a bright future for epoxy resin uses not only in Canada but in other countries as well.

John Allan, St. Catherines Brass Works, St. Catherines, Ontario, presented *"Shrinkage Effects and Control in Cast Iron."* Allan used slides to illustrate his talk. He emphasized the importance of gating and risering in producing sound castings and recommended a thorough investigation of each casting, its drawing, alloys, and gates and risers prior to actual production. He said that underfeeding and undergating were largely responsible for unacceptable castings.

Factors effecting gating and risering are shrinkage of metal, pouring rates, pouring temperatures, sand, mold density and weight shifts. He added that any change in these factors is essentially a change in the gating and risering system.

Alex Pirrie, American Standard Products (Canada) Limited, Toronto, and AFS national director, served as the Thursday evening chairman. I. H. Dennen, Beardsley & Piper, Chicago, presented a film on *"Mechanization in Small Foundries."*

Dennen said that both in Canada and in the United States the small shops out-number the large foundries. However, he said that the smaller foundries have not been keeping pace with increasing production. He stated that the answer lay in mechanization. Not total mechanization, but only to the degree practical. The most likely areas he said were sand preparation, the core room and the molding operations.

Friday's activities began with plant tours. Foundries open for visits included Crane Ltd. and Griffin Steel Foundries Ltd. in addition to the four opened for tours on Thursday.

George Turnbull, Canada Iron Foundries Ltd., Montreal, served as technical chairman for the afternoon session. Everett Chapman, consulting engineer, West Chester, Pa., gave an illustrated lecture on *"Nitches and Notches"* covering basic design problems. Photoelastic slides demonstrated the effect of design on stress distribution and endurance of metals.

Chapman suggested that abrupt changes in section caused many casting failures and that further studies be made in improving designs so that boundry failures would be decreased. Films were shown demonstrating that many failures are not visible.

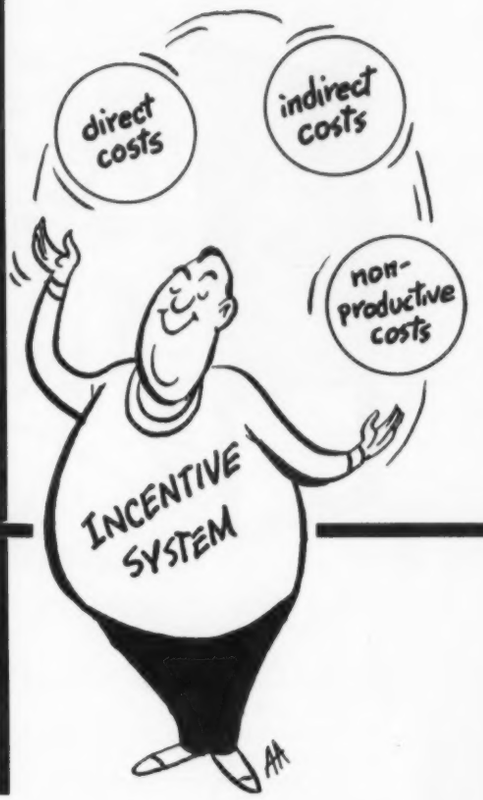
The conference was concluded Friday night with a dinner. Wm. W. Maloney, AFS general manager was the speaker. He stated that the foundry industry was to increase greatly in the future merely on the basis of an increasing population. However, he said education and research are the keys for improving foundry techniques to keep abreast with competitive technological advances.

Organizing committees were composed of: W. T. Shute, Canadian Steel Foundries (1956) Ltd., conference chairman and technical program; A. J. Moore, Canadian Bronze Co., Ltd., conference vice-chairman, publicity and arrangements; W. P. Sullivan, Warden King Limited, editor of booklet and printing; J. H. Newman and G. H. Robb, Newman Foundry Supply Ltd., housing and registrations; G. K. Scanlon, Canadian Foundry Supplies and Equipment Ltd., George Barrett, Dominion Engineering Works Ltd., R. Edminson, Canadian Refractories Ltd., and Wm. Nuttall, Warden King Ltd., plant visits; Lucien Guilmette, Canadian Foundry Supplies and Equipment Limited, finance; Robert Stott, Canadian Steel Foundries (1956) Ltd., entertainment; Wm. Harris, Canada Iron Foundries Ltd., Claude Bourassa, Archer Daniels Midland Co., Ltd., R. B. Whiting, LaSalle Coke Co., and A. J. Parsons, Canadian Steel Foundries (1956) Ltd., advertising. Morris McQuiggan, LaSalle Coke Co., Eastern Canada chapter chairman; and Leon Lesage, Three Rivers Tech. School, illustrator.

C. C. Erhart, Jr. /
The Chris Erhart Foundry & Machine Co.

Herbert Wagers /
The Chris Erhart Foundry & Machine Co.

HOW AN INCENTIVE SYSTEM BROUGHT BACK OUR BUSINESS



Erhart foundry cut labor costs 25 per cent, set prices on accurate data, won workable control system

Faced with rising costs, a declining income and net profits, and an increasingly unfavorable competitive position, The Chris Erhart Foundry and Machine Co., Cincinnati, installed a wage incentive system as a means of recovery.

The results have been highly satisfactory: Direct and indirect labor costs cut 20 to 25 per cent; Prices now set on the basis of standard data and directly reflecting the actual amount of work in each casting; A workable system of control has been achieved.

Although all signs pointed to the incentive system as the answer, several factors had to be considered before the plan was adopted.

The incentive plan would involve an initial outlay plus the additional money needed to keep the plan in operation. Another factor was labor's views. Finally, would the incentive plan actually be adaptable to a small jobbing foundry employing 65 to 70 men.

Among the expenses of the program would be the hiring of a consulting firm. This would add to the already high non-productive expenses After much thought and discussion with comparable firms already having wage incentive plans, the decision was made to hire the consultants.

Our company makes approximately 1500 to 2000 pattern changes monthly and it has found that the standards department could be operated by two men. Each man in the shop makes out his own time sheet and keeps track of his down time. The sheets have been found to be accurate and the men have more confidence in the incentive program by actually participating in keeping its records.

During the past three years we have set in excess of 100,000 separate standards. Considering the number of standards set and dividing them by salaries gives an idea of the dollar cost per standards. However, this figure is probably misleading because many more contributions are being made to the good and betterment of the company by the standards department besides the function of setting standards. On this basis the cost of an individual standard is very low if the different contributions of the standards department is considered.

In the specific savings the reduction of labor costs has been accomplished through increased production per man and by detecting areas which are overstaffed, as well as the greater utilization of existing labor saving devices and the acquisition of new equipment recommended through cost studies.

A better competitive position is enjoyed through more realistic pricing. Customers now realize that they are not paying part of the cost of someone else's casting in their purchase price. By utilizing standard data on the type of pattern equipment, our company is able to forecast accurately and estimate costs on a particular casting costs on any price inquiries. The same standard data can also be used as a basis for a production control system to schedule accurately and balance the work flow through the shop.

By collecting and analyzing direct, indirect and non-productive labor costs each week, the company is able to pinpoint and correct any costs which are either excessive or out of line. Any increase or decrease in a particular department can be noted at a glance and action taken immediately. The trouble does not remain hidden for many months as could happen without some method of bringing to light the actual conditions.

These same figures can be used as a basis by management for planning to forecast what labor costs will occur at a particular volume of operation. The figures should be used to determine just how much the incentive system is accomplishing in terms of dollar savings. This is in direct contrast to the practices made before incentives were adopted when only casual cost controlling was accomplished. This is understandable for no current figures were available to spotlight the trouble areas.

A further benefit is that a gage of supervisory effectiveness is available with the weekly report. As the costs fluctuate the supervisor's utilization of his men, material and machinery is clearly reflected. By comparing current costs figures with previous reports, the progress being made can be determined and remedial action taken. It also shows the savings made in each department. Probably the control achieved with the incentive system is one of the most important features of the plan.

Some feel that methods should be improved and standardized be-

fore an incentive program is adopted. However, this will often delay the application of the standards to a prohibitive point.

The Chris Erhart Foundry and Machine Co. chose to apply the standards and then to improve methods and procedures and to adjust the standards as the amount of work in a given operation changed. This was admitting that methods improvements were desireable and necessary. With the data as a guide, the company had a means of comparing alternative methods and equipment and a basis to choose the better for each operation.

The incentive program and the production control which it has brought have stimulated interest in better use of men and equipment.

In a jolt rollover operation three men were required to hand shovel all sand with a daily output of 12 sand molds. Study showed that hand shoveling was the area needing the most improvement. Further study revealed that a mobile sandslinger was used but a small percentage of the time and that ample time was available to ram molds. Using the sandslinger to ram molds was made without any additional investment and by more fully using the equipment on hand. As a result the manpower was reduced from three men to one, the output rose to 20 and mold quality was also improved with a more uniform ram and the amount of scrap was materially reduced.

This same procedure was applied to an adjoining and similar operation with the operation reduced from two men to one. The results have not only been gratifying because of the savings but because much of the back breaking work and drudgery has been eliminated making the foundry a better place to work.

Standards are particularly invaluable to the small jobbing foundry, because often times the records maintained and the information gathered by the standards department would not otherwise be available nor kept on file. For instance, we maintain a complete description of all castings made, whether one casting is made from the pattern described or 100. At a later date when the pattern is likely to be reused, we still have data concerning pattern description, flask size, casting weight, number of cores, and any other particular information concerning the casting to be made. The files of the standards department become a storehouse of pertinent information readily tapped and available for instant use.

It is the view of the top executives of our company that without incentives and the controls attained, and the savings made, that the competitive position of our company might be entirely different. It is felt that incentives have been an invaluable tool in not only reducing our operating costs but also in taking the guesswork out of estimating costs for quotation purposes. It has taken the guesswork out of the evaluation of an operator's output as well as the supervisor's accomplishments. It has removed much of the arbitrary judgment from our plant and replaced it with scientific management, a solid and substantial basis for management decisions and planning.

With competition steadily getting keener it behooves every management to make their organization as efficient as possible, and to get the maximum return out of every dollar spent for plant operation. Incentives are one of the most valuable tools which management can choose to gain these ends.

Since incentives were adopted in our own plant, labor costs have been substantially reduced in each department. While we have not reached the point of maximum savings possibilities, at least we have made a good start. We know how our labor dollars are being spent, we have a goal for which to strive, and we can chart our progress in attempting to reach our goal of maximum savings possibilities. It is in such a manner that costs can be reduced.

Scholarship Becomes Wm. B. Coleman Memorial

■ A lasting, living memorial to the diligence and devotion with which William B. Coleman served the foundry industry and the Philadelphia Chapter of AFS has been established in the form of a scholarship fund at Pennsylvania State University.

The chapter is now conducting a campaign to raise an additional $15,000 which will make the fund self supporting without further contribution from the operating funds of the group. The fund was originally created with $5,000 set aside by the chapter.

Pledge cards for contributions have been distributed to foundries and allied industries in the Philadelphia area. The chapter states that the contribution may be made over a 24 month period, if the contributor wishes. Headquarters for the fund drive is at the Philadelphia Chapter, AFS, Ashland Street below E. Lewis St., Philadelphia 24, Pa.

The award is made annually to a senior student at Penn State who is enrolled in industrial engineering, mechanical engineering, or metallurgy. The award has now been made for two years.

The $500 grant is made on a basis of past academic achievement as shown by the student's rank in the upper two-fifths of his class; desirable personality and character traits; evidence of leadership; past association with and interest in the foundry industry, and financial need.

William B. Coleman was president of W. B. Coleman & Co., chemical and metallurgical consultants, a firm that he founded in 1922. He was the first chairman of the AFS Philadelphia Chapter, and at the time of his death was serving as secretary-treasurer. He was active in other professional societies and was past president of the American Society for Metals.

Coleman was a University of Pennsylvania graduate, whose first commercial experience was with Midvale Steel Co. In 1918 he became superintendent, Tacony Ordnance Corp., which was absorbed by Penn Seaboard Corp., and he remained there until he organized his own firm.

foundry trade news

Crucible Steel Co. . . has acquired the entire interest in Vacuum Metals Corp., pioneer producer of high vacuum cast metals and alloys.

Caterpillar Tractor Co. . . is marking the 25th anniversary of its introduction of the modern, mobile heavy-duty diesel engine. The very first diesel-powered Caterpillar "60" is still in operation at Quincy Lumber Co., Inc., Quincy, Calif.

I. Schumann & Co. . . Cleveland smelter has announced a new process which is said to produce brass and bronze ingots with rigidly controlled properties.

Pettibone Mulliken Corp. . . has acquired the Mercury Mfg. Co., Chicago. Mercury manufacturers tow tractors, electric lift trucks and trailers.

American Lithium Institute, Inc. . . has been formed to conduct research on lithicum and its compounds. A non-profit organization, the institute will maintain offices in Princeton, N. J., under the direction of Marshall Sittig.

Allegheny Ludlum Steel Corp. . . has announced completion of a new furnace for melting high purity zirconium metal for structural and fuel element applications in atomic reactors.

American Steel Foundries . . has reported the largest earnings in its history. For the fiscal year the company reported net income of $8,370,614 on sales of $117,130,270.

Carver Foundry . . plant at Fairview Village, Pa., has elected the following officers: L. E. Snyder, president; Frank J. Arnold, vice-president; M. A. Kriebel, secretary-treasurer. W. J. White is plant manager.

Zirconium Corp. of America . . has cut the cost of pure zirconium oxide by 25 per cent. This is said to pave the way for economical super refractory application of stabilized zirconia.

Joseph Dixon Crucible Co. . . has completed the first phase of a facilities expansion program for the manufacture of refractory products. The first phase involved construction of a new high temperature kiln.

Babcock & Wilcox Co. . . revealed at the annual conference of the Atomic Industrial Forum that it has "greatly reduced" production time on manufacture of fuel elements it is making in its Nuclear Facilities plant at Lynchburg, Va.

W. B. Coleman & Co. . . the Philadelphia Pa., chemical and metallurgical consulting firm founded in 1922 by the late W. B. Coleman is continuing in business under the direction of Mrs. W. B. Coleman.

Carborundum Co. . . has reorganized its advertising department under the supervision of ad manager, Burchard M. Day. J. W. Wade will handle advertising for bonded abrasives, J. A. Mark is in charge of coated abrasives, and J. M. Smith will manage advertising for refractories.

Ironton Fire Brick Co. . . Ironton, Ohio, firm prepared an exhibit for display in the Ironton Festival of the Hills celebration. The display showed the steps from mining raw clays to the use of the finished product in a gray iron cupola.

Central Foundry Co. . . firm with plants at Newark, N. J., and Holt,

Caterpillar Tractor: first diesel unit still active after 25 years.

Foundry Trade News

Link-Belt: new plant near Los Angeles slated for operation in 1957.

Ala., has published a booklet describing their patented process for producing centrifugal cast soil pipe.

Link-Belt Co. . . will build a new plant in Montebello, Calif., to replace facilities at 361 South Anderson St., Los Angeles.

Precision Mfg. Co. . . Plano, Texas, plant specializing in shell mold castings was recently the subject of an article in a special issue of the *Dallas Times Herald* devoted to the town of Plano.

C. E. Lueders & Co. . . has been appointed Shell Process, Inc.'s representative in Delaware, Maryland, New Jersey, and eastern Pennsylvania.

Cooper Alloy Corp. . . Hillside, N. J., plant has won the highest safety award given by Steel Founders Society.

Per Mo Cast . . is the new name of the Santa Clara Foundry, Santa Clara, Calif.

Electro Metallurgical Co. . . has opened a Vacuum Technology Building at its Metals Research Laboratories in Niagara Falls, N. Y., for the study of vacuum technology.

International Nickel Co., Inc. . . has established a scholarship at Illinois Institute of Technology, designed to encourage liberal arts students to acquire an engineering education. The scholarship will be awarded to students who transfer to IIT from one of the 29 liberal arts schools participating in a combined study plan.

Sutter Products Co. . . manufacturer of foundry machinery and equipment has moved to Holly, Mich. The new 44,000 sq ft building more than triples previous plant facilities. New address is Hadley at Grant Sts., Holly, Mich.

Alan Wood Steel Co. . . sold $10 million more in the first nine months of 1956 than in the same period in 1955.

Hunter Foundry Co. . . Chicago plant has joined Non-Ferrous Founders' Society.

Waterbury Farrel Foundry & Machine Co. . . has acquired the Sendzimir Cold Rolling Mill interests of the Armzen Co.

Marion Power Shovel Co. . . has been acquired by the Universal Corp. and the operation will be continued as a division of Universal.

Morse Instrument Co. . . the foundry of this Clinton, Ohio, instrument firm has joined AFS.

Sutter Products: new headquarters and plant at Holly, Michigan.

local foundry news

Welding Discussed at Oregon

Oregon Chapter members Nov. 14 at the Heathman Hotel, heard Dr. William H. Rice, Electric Steel Foundry Co., Portland, Ore., discuss the latest developments and techniques of welding. Among the processes covered was the submerged arc process in which the arc is kept under a blanket of granulated flux. He also spoke on methods for welding various casting metals.

Philadelphia Foundrymen Hear Discussion on Cupola Practice

Philadelphia Chapter's November meeting held at the Engineers Club was attended by 150 persons. Howard H. Wilder, Iron Foundry Div., Vanadium Corp. of America, discussed *"Cupola Practice."* Wilder stated that "the operations of the melting department should be placed in the hands of some individual. Let him be responsible for its functioning. Too many times this function is dominated by so many that no one is in control."

Dr. Arthur E. Schuh, U. S. Pipe & Foundry Co., and chairman of the AFS cupola research committee, served as technical chairman.

Leo Houser and Dan Nichols of Dodge Steel Co., Philadelphia, showed films and slides taken at the annual outing of the Philadelphia chapter.

Saginaw Valley Has 3 Speakers

Three technical sessions were presented at the November meeting of the Saginaw Valley Chapter held at Fischer's Hotel, Frankenmuth, Mich. L. G. Day, Light Alloys Ltd., Haley, Ontario was the speaker at the light metals section. Harvey E. Henderson, Lynchburg Foundry Co., Lynchburg, Va., discussed *"Acid Cupola Operation With Hot Blast"* and John N. Ludwig, Jr., Electro Metallurgical Co., presented *"Acid Electric Furnace Process in Steel Foundry Practice."*

The AFS movie *"A Study of Vertical Gating and Design"* was shown.

Utah Becomes 46th AFS Chapter

The AFS Board of Directors has officially approved the petition of the Utah foundrymen to form a Utah Chapter. The Utah Chapter becomes the 46th in AFS. Plans are to meet alternately in Salt Lake City and Provo. Its territory includes Utah, Arizona, and southern Idaho. The officers and other details are covered in the December issue of MODERN CASTINGS.

Maintenance Topic At Columbus

Preventive maintenance was discussed at the October meeting of the Central Ohio Chapter meeting at the Seneca Hotel, Columbus, Ohio. Featured speaker was C. E. Fausel, Central Foundry Div., General Motors Corp., Danville, Ill. Fausel said that preventive maintenance was a basic part of high production. He stated that "mechanical maintenance on the production lines means controlled maintenance. When maintenance is controlled properly it means there can be no down-time through the eight-hour shift."

Kennedy Memorial Apprentice Contest Entering Fourth Month of Competition

Brass Founders See AFS Film

The November meeting of the Metropolitan Brass Founders Association, Inc. was held at the Triangle Hofbrau, Richmond Hill, N. Y. and featured a film on the AFS Atlantic City Convention. The film was supplied by Beardsley & Piper Div. Pettibone Mulliken Corp.

Education Theme At Twin-Cities

Education was the theme of the October meeting of the Twin City Chapter meeting at the Covered Wagon restaurant. Five educators from the Twin Cities discussed the present vocational program and presented recommendations for foundrymen to promote a broader training program. These included acquainting instructors with foundry technology; assisting teachers in gaining practical experience through summer work, field trips or acting as advisors on preparing teaching aids; and promoting expansion of training through promotional letters.

Timberline Chapter Hears Scaggs

Timberline Chapter members meeting Nov. 12 at the Oxford Hotel, Denver, Colo. heard Frank M. Scaggs, Oklahoma Steel Castings Co., Tulsa, discuss "Core Making with the CO_2 Process." Curtis Drake, Griffin Wheel Co., who attended the installation of the Utah Chapter, discussed the formation of that chapter.

Central Illinois Chapter at its November meeting in the American Legion Hall, Peoria, Ill., had as its speaker Wm. Ball, Jr., R. Lavin & Sons, Inc., Chicago, who duscussed *"Human Engineering."* Ball is shown in the center, flanked by K. M. Smith, Burt Bevis, James Leach and James Miller. Smith is Chapter chairman and Bevis technical chairman. Both are with Caterpillar Tractor Co. Leach is a professor at the University of Illinois and Miller chairman of the student chapter.

Chapters start activities on local level, new record seen

Competition in the 1957 Robert E. Kennedy Memorial apprentice contest is in its fourth month and many chapters have plans well underway for local competition. Last year 16 chapters held contests with winners going into national competition. Indications are that this number will be exceeded in 1957.

More than 430 individuals competed in the 1956 contest. Seven local chapters had national winners. They were Central Ohio, Wisconsin, Washington, Northeastern Ohio, Southern California, Detroit and Ontario.

Prizes of $100, $50 and $25 will be awarded to first, seeond, and third place winners in each of five divisions. These classifications are wood patternmaking, metal patternmaking, iron castings (all ferrous castings other than steel), steel molding and non-ferrous molding.

In addition to the prize money, first place division winners will have their first class round trip transportation paid to the First Engineered Castings Show in Cincinnati. Pullman accommodations will be paid in the case of rail transportation.

The contest will be judged in Chicago approximately 30 days prior to the opening of the Cincinnati show.

Under eligibility rules the term apprentice is understood to mean a learner or trainee in the all-around practices of the trade who has not had over five years experience in the pattern trade nor more than four years in the foundry trade. The amount of apprentice training completed has no bearing on the eligibility for this contest and is not considered in the judging.

Neither the contestants nor the company by whom they are employed are required to be AFS members.

First, second and third place winners in the 1956 contest and their chapter or company affiliation:

Wood patternmaking—Herb Nelson, Washington, Ed. Poole, Washington, and Lewis Backus, Northeastern Ohio.

Metal patternmaking—Herbert L. Zigler, Northeastern Ohio, Stanley Stobierski, Northeastern Ohio, and James A. Smith, Detroit.

Iron Molding—Stanley R. Varr, Brown & Sharpe Mfg. Co., Providence, R. I., Eugene Calhoun, Howell Fdy. Co., Los Nietos, Calif., and James R. Walton, Caterpillar Tractor Co., Peoria.

Steel molding—Mert West, Ohio Steel Foundry Co., Springfield, Ohio, Joseph Zohil, Dodge Steel Co., Philadelphia, and Jesse Lawson, Continental Fdry. & Mach. Co., East Chicago, Ind.

Non-ferrous molding—Donald Tetzlaff, Wisconsin, Raymond Montano, Wisconsin, and Arthur Berge, Eastern Canada.

When the **Chicago Chapter** has a Scholarship Night, there are no half-way measures. The Chapter's own Robert E. Kennedy Scholarship was expanded to cover three students this year, and the Kensington Steel Co. took the advantage of the opportunity also to present three awards to college students attending University of Illinois.

Present for the award-giving were Prof. Roy Schroeder and Dean Fred Trizise, University of Illinois' Navy Pier branch, winners Joe Castranova and Arnold Alek, John Rassenfoos, winner Fred Bahr, and Bob Shauss chairman who with Rassenfoss represented the Chicago Chapter.

John Rassenfoss awards the Robert E. Kennedy scholarship checks to Joseph Castranova, Arnold Alek, and Fred Bahr. Returns from the scholarship fund investment permitted award of three scholarships this year to Univ. of Illinois students.

Professor Roy Schroeder awarded the checks for the Kensington Steel Co. Scholarships to Ronald Andretich and Roy Hlavacek. Algert Stanevich, also a winner, was not present. The firm maintains AFS student memberships for the boys and offers summer employment and employment after they have finished their education.

Shell Molding At New England

New England Chapter members meeting at the University Club, Boston in November heard a discussion on *"Practical Usage of Shell Molding"* given by Mac Petrie, Shell Process, Inc., Chicopee, Mass. More than 100 persons attended. A. M. Nutter chapter president, presided.

Chesapeake Chapter Schedules Its Oyster Roast For January

Cheaspeake Chapter's annual Oyster Roast will be held at 1 pm January 19 at the Alcazar, Balto, Md.

At its November meeting Clyde A. Sanders, American Colloid Co. spoke on *"What Sand for What Type of Casting?"* He stated that combustibles in sand should be held under six per cent and that synthetic sand should not be adopted for use in the foundry unless facilities are available to keep it under strict and rigid control at all times.

Quad-City Chapter Active In Forming Educational Program

Through efforts of the AFS Quad-City Chapter a foundry educational program is well underway at both Davenport and United Township high schools. The chapter has been instrumental in the formation of this program and has supplied much of the equipment. In addition two students are invited each month to attend the chapter meetings. Local foundries also have plant tours for the students.

local foundry news

Northeastern Ohio's Chapter at its November meeting heard John A. Mueller discuss *"Save On Snagging and Cut-Off."* Mueller said that costs can be reduced substantially with the selection of proper wheels and using them at the most efficient speeds.

Lehigh Valley Foundrymen's Association held its first technical session at Lafayette College, Easton, Penn. Lynford W. Butz, Bethlehem Steel Co., spoke on *"Manufacture of Pig Iron,"* tracing steps from raw materials to finished product. Shown left to right, are Albert Mathieu, Speaker Butz, Harry R. Dunstan and Robert Latham, chairman of the Lehigh Valley Foundrymen.

Texas Chapter members at the November meeting listened to *"Sand Reclamation"* given by Clifford E. Wenninger, The Hydro-Blast Corp. The speaker is shown at the stand with E. C. Brown, program chairman and W. A. Bearden, Chapter Chairman. Wenninger discussed the problem of developing a wet sand reclamation that could be made from a standard equipment now on the market. This program was assigned to the University of Kentucky. Wenninger said it was economical to install dry reclamation where sand consumption is as low as eight tons daily.

Northern California Chapter members listened to *"Utilization of Modern Welding Techniques for Foundries"* at the November meeting. Dr. W. H. Rice, Electric Steel Foundries Co., Portland, Oregon was the speaker. Shown left to right are Harold Henderson, George Stewart and Dr. W. H. Rice the evening speaker.

Cincinnati Hears Kessler

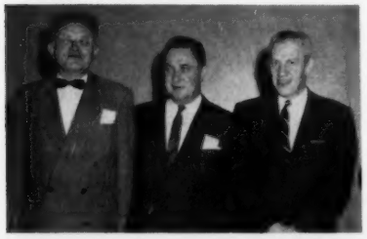
More than 100 persons attended the October meeting of the **Cincinnati Chapter** held at the Anthony Wayne Hotel, Hamilton, Ohio. Harry Kessler spoke on "Gating and Risering" stressing that consistency of materials and melt quality are the basic means of standardizing gating and risering practices.

Birmingham's Chapter in October held its first technical session of the year. Past Chairman Henry J. Guthrie is shown receiving an AFS Chapter award for leading the chapter in exceeding its membership quota. Giving the award is John Drenning, Kerchner Marshall Co. Seated at the lower left is Herbert Stockham, Jr., Stockham Valves & Fittings Co. who was a speaker. Program chairman Sam F. Carter, Jr., is seated at right. The feature of the technical session was a talk on *"Digging Into Sand Fundamentals"* presented by C. E. Winninger of the Hydro-Blast Corporation.

Metropolitan Chapter members at its November meeting heard discussions on the practical applications of the CO_2 process. Reading left to right are Charles Pruesch, Paul H. Ducharme, Hans Jacob and R. Colton. Jacobs and Ducharme were speakers, Pruesch was the technical chairman. Colton is president of the Metropolitan chapter. The meeting was held at the Essex House, Newark New Jersey.

Buffalo Chapter's November meeting featured a talk by Emil A. Piper, chief engineer, Pohlman Foundry Co., Inc., Buffalo, N. Y., who spoke on *"A Glimpse of European Foundries."* Shown in the photograph are Milton E. Emery, Chapter Chairman, Buffalo Pipe & Foundry Corp., congratulating speaker E. A. Piper.

Michiana Chapter's November meeting was held at Mishawaka, Ind. *"Foundry Research and Development"* was speaker Dan Krause's topic. German Trade Fair Slides were shown.



Pittsburg's Chapter at its October meeting heard George H. Johnstone, president, Johnstone Foundries, Inc., speak on *"European Gray Iron Foundry Practice"* dealing with cupola practice, molding, core making and cleaning. Officers shown left to right are G. J. Miklos, E. J. Biller and E. P. Buchanan.

for the asking

Core rod dip oil and no-vein compound are presented in four-page bulletin listing instructions for use and application. No-vein compound is used as a hot strength and high temperature plasticizer in core and molding sands. *Delta Oil Products Co.*

CIRCLE NO. 41, PAGE 7-8

Melting equipment installation case history describes how greater melting producing capacity was obtained. Each unit is explained and pictures accompany text. *Whiting Corp.*

CIRCLE NO. 42, PAGE 7-8

CO_2 process equipment including core shooters, gassing apparatus and sand mixer are described in four-page bulletin. Gasser said to harden shells in 3 sec. *Carver Foundry Products.*

CIRCLE NO. 43, PAGE 7-8

Vibrators, air and electric, are contained in four-page catalog. Units equipped with automatic or remote controls and in kit form. *The Cleveland Vibrator Co.*

CIRCLE NO. 44, PAGE 7-8

Blast cleaning abrasives, their characteristics, application and selection are featured in a 12-page illustrated bulletin 333. Tables give sizes and screening specifications of abrasives as well as S.A.E. classifications of shot and grit in a complete range of sizes. Illustrations show installations of equipment and photomicrographs demonstrate the differences between shot and grit blasted surfaces. *Pangborn Corp.*

CIRCLE NO. 45, PAGE 7-8

Electric furnace fume control bulletin 553-D in four-pages describes case histories of product installation accompanied by pictures. *Wheelabrator Corp.*

CIRCLE NO. 46, PAGE 7-8

Heat-Resistant protective coatings are covered in four-page illustrated catalog. Line is designed to protect metals from scaling and corrosion at temperatures to 2100 F. Four types are described. *Markal Co.*

CIRCLE NO. 47, PAGE 7-8

Hobby casting set for home use available in kit form. Sets come in three sizes and include necessary equipment. Furnace may be operated on natural gas, coal gas, butane or acetylene. *Kansas City Specialties Co.*

CIRCLE NO. 48, PAGE 7-8

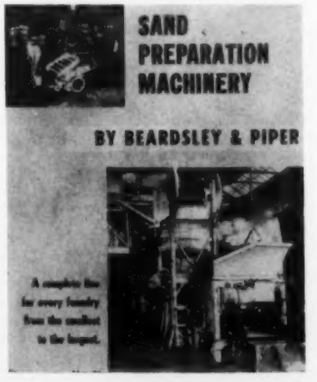
Portable muller requiring no foundations, hoists or ceiling supports is presented in bulletin 524, four pages. Operated by 3 hp 1800 rpm motor, all power used for mixing. Capacity ranges from 150 to 300 lbs per batch. *National Engineering Co.*

CIRCLE NO. 49, PAGE 7-8

Industrial radiography materials and accessories catalog lists prices and products and film characteristics. *Eastman Kodak Co.*

CIRCLE NO. 50, PAGE 7-8

Sand preparation machinery, a complete line designed for foundries from the smallest to largest. Bulletin 1230



contains 24 pages and includes specifications and photos of equipment in use. *Beardsley & Piper Div. Pettibone & Mulliken.*

CIRCLE NO. 51, PAGE 7-8

Foundry alloy products book discusses ductile iron additives, ferro-alloys,

CIRCLE NO. 130, PAGE 7-8

CIRCLE NO. 131, PAGE 7-8

molybdenum alloys, monel and nickel. A data section contains hardness conversion table and glossary. *Whitehead Metal Products Co., Inc.*

CIRCLE NO. 52, PAGE 7-8

Aluminum alloys not requiring heat treatment are discussed in eight-page bulletin giving compositions, physical

and mechanical properties of Ternalloy. Also covered are processing characteristics. *Apex Smelting Co.*

CIRCLE NO. 53, PAGE 7-8

Colloid dispersions for high-temperature lubrication is discussed in bulletin No. 423. Numerous product design applications involving pre-assembly coating and utilization of colloidal dispersions are also carried. *Acheson Colloids Co., Div. Acheson Industries, Inc.*

CIRCLE NO. 54, PAGE 7-8

Automatic shell molding system. Book 2462 in eight pages describes operations producing up to 240 shells per hour based on indexing of 15 sec. *Link-Belt Co.*

CIRCLE NO. 55, PAGE 7-8

Arc furnace electrical equipment is covered in Bulletin GEA6351, 16 pages. Included are transformers, switchgear, controls, DC motors and service shop and productive maintenance. Well illustrated. *General Electric Co.*

CIRCLE NO. 56, PAGE 7-8

Magnetic particle inspection catalog in 16 pages, explains the principle of system and its applications. Case histories illustrate surface cracks as well as other types of defects. May be used as adjunct to stress analysis by foundries. *Magnaflux Corp.*

CIRCLE NO. 57, PAGE 7-8

Metalworking companies and other manufacturers are being encouraged to locate in Puerto Rico by its Economic Development Administration which has prepared a 72-page refer-

ence brochure including maps and charts. *Commonwealth of Puerto Rico Economic Development Administration.*

CIRCLE NO. 58, PAGE 7-8

Automatic barrel plating and processing and barrel tumbling and finishing machines are covered in colored leaflet, illustrated. *Frederic B. Stevens, Inc.*

CIRCLE NO. 59, PAGE 7-8

Zircon data sheet describes physical characteristics on this little known mineral which has a high resistance to corrosive agents and is not wetted by molten metals. *Orefraction Inc.*

CIRCLE NO. 60, PAGE 7-8

Polishing and grinding wheel applications in case history form are contained in 12-page publication. Wheels are formed from die cut, cloth-backed coated abrasives leaves locked in a hub. *Minnesota Mining and Mfg. Co.*

CIRCLE NO. 61, PAGE 7-8

Epoxy resin advantages, procedures, physical properties and tooling tips with an illustrated sequence are featured in three bulletins, 400, 401 and 402, all punched for incorporation into notebooks. *United States Gypsum Co.*

CIRCLE NO. 62, PAGE 7-8

Dust and mist collectors ranging in size from 314 to 1050 cfm are described in four-page bulletin. Dustkops over 400 cfm use cyclone separator principle either with a fibreglass filter or outside exhaust connection. *Aget Mfg. Co.*

CIRCLE NO. 63, PAGE 7-8

Plaster mold castings eight-page reprint covers the Antioch process for casting. Advantages claimed are pressure tightness, dimensional accuracy, intricacy of design, smoothness and detail. *Morris Bean & Co.*

CIRCLE NO. 64, PAGE 7-8

Grommet V-belt which provide 20 to 50 per cent longer life is described in bulletin 20B6497C, four-pages. Texrope is said to also run cooler and grip better. *Allis-Chalmers Mfg. Co*

CIRCLE NO. 65, PAGE 7-8

Hand grinding and wet grinding are discussed in AB METAL DIGEST, eight pages devoted to discussion of products. *Buehler Ltd.*

CIRCLE NO. 66, PAGE 7-8

Die cast engine block manufacture reprint covers the history of producing block weighing 143 lbs less than iron. Included are design require-

ments and drawings showing engineering phases of the operation. *Doehler-Jarvis Div. National Lead Co.*
CIRCLE NO. 67, PAGE 7-8

Vises and tool holding equipment catalog No. 9156, 16 pages, contains information on machine tool vises, angle vises, adjustable angle plates, adjustable lathe fixtures, quick acting vises and parallel clamps. *Universal Vise & Tool Co.*
CIRCLE NO. 68, PAGE 7-8

Gray iron engineering properties are graphically displayed in Reecemelt engineering data, 14 pages with charts and graphs. Trend curves allow engineer to choose combination of properties desired. *Herbert A. Reece & Assoc.*
CIRCLE NO. 69, PAGE 7-8

Titanium, how it is made is illustrated from chlorinator to extrusion, sheets wires or billets. Chart shows titanium sponge production has risen greatly since 1948. *Titanium Metals Corp. of America.*
CIRCLE NO. 70, PAGE 7-8

Fired refractory materials catalog No. RB-20 covers 19 standard brands of brick as well as line of furnaces and kilns. To simplify selection the catalog lists classification, properties and applications of each brand. *Richard C. Remmey Son Co.*
CIRCLE NO. 71, PAGE 7-8

Flexible shaft machine catalog 57, eight pages, features machines for grinding, sanding, polishing and other finishing operations. Available with truck, pedestal, bench and suspension type mountings. *Stow Mfg. Co.*
CIRCLE NO. 72, PAGE 7-8

Surface pyrometer catalog No. 168 in six pages covers line including interchangeable thermocouples and extension arms, applications and special purpose equipment. *The Pyrometer Instrument Co., Inc.*
CIRCLE NO. 73, PAGE 7-8

Automobile facts and figures are contained in 36th edition. Statistics include such catagories as replacement part sales, registration by states and state list of car and truck dealers in the U. S. *Automobile Manufacturers Assoc.*
CIRCLE NO. 74, PAGE 7-8

Pallet boxes, wirebound, are covered in eight-page catalog. Made of resawn hardwood and available in variety of sizes the boxes can handle loads of 3000 lbs and are easily as-

sembled and reusable. Expendable boxes are also covered. *General Box Co.*

CIRCLE NO. 75, PAGE 7-8

Scientific equipment catalog lists laboratory items from aerators to polyethylene wear. Thirty pages, illustrated. *Central Scientific Co.*

CIRCLE NO. 76, PAGE 7-8

Epoxy resin technical bulletin No. 14 gives details of making weldless repairs to iron and steel tanks, conduits, containers and surfaces. *Smooth-On Mfg. Co.*

CIRCLE NO. 77, PAGE 7-8

Plaster mold castings, the selection of materials and design considerations are discussed in eight pages. Included are pictures, drawings and physical characteristics. *Universal Castings Corp.*

CIRCLE NO. 78, PAGE 7-8

Investment castings using the Kolcast or liquid mercury process are covered in 16-page catalog showing the versatility of the process and facilities maintained for research and development. *Kolcast Industries Inc.*

CIRCLE NO. 79, PAGE 7-8

Air valves with only one moving part are covered in six-page catalog complete with illustrations showing mountings and construction. *Mechanical Air Controls, Inc.*

CIRCLE NO. 80, PAGE 7-8

Abrasive technical magazine covers new abrasive 44 Alundum recommended for snagging castings and cutting down weld beads, 16 pages. *Norton Company.*

CIRCLE NO. 81, PAGE 7-8

Refractory castables bulletin, four pages, features high temperature service and light weight insulating types. Tabular matter affords information on maximum operating temperatures, quantities required and amount of water needed. *Walsh Refractories Corporation.*

CIRCLE NO. 82, PAGE 7-8

Vacuum processing data, catalog No. 752 has 28 pages, contains specifications as to pumps, formulae, constants, conversion factors, solutions to pump selections and maintenance procedures. *F. J. Stokes Corp.*

CIRCLE NO. 83, PAGE 7-8

Dust collector using patented oval filtering bags are contained in Bulletin DA-7, eight pages. Drawings and filtering capacity charts are contained in illustrated booklet. *Parsons Engineering Corp.*

CIRCLE NO. 84, PAGE 7-8

questions and answers

MODERN CASTINGS invites its readers to submit questions concerning technical foundry problems. We can't guarantee to answer everything but we would like to try. This month we have been asked:

oil passages

How can we cast oil passages, approximately 1/4 in. diameter by 18 in. long, in gray iron castings?

With this small a diameter and long length you will probably find it advisable to resort to the use of steel tubing. Tubing not only gives a uniform hole but is versatile in its ability to be bent into complex shapes. To minimize any tendency for melting or deformation of the tube under the influence of molten metal, it is recommended that the tube be packed with finely divided graphite. The graphite is easily removed after casting shakeout. Cores for straight holes can also be machined from graphite electrode stock and removed later with an electric drill. Probably the most versatile possibility arises from the use of a special mixture of 20 mesh graphite grain plus about 3 per cent phenol formaldehyde resin. Add enough corn cereal binder and water to give it green strength and workability. This mixture can be rammed into a core box, removed and baked at 450 F. The final core is strong, resists metal penetration, and is easily removed from the finished casting.

gray iron tolerances

We are trying to find out if there are any established commercial tolerances for gray iron casting dimensions.

There are no official commercial tolerances for gray iron castings. In a paper by Lyle L. Clark, entitled "Fundamentals Make Better Castings", 1954 AFS TRANSACTIONS, the following table was printed and may serve as a guide:

Casting Dimensions	As-Cast Tolerances
2 in.	±0.010 in.
4 in.	±0.020 in.
6 in.	±0.030 in.
8 in.	±0.040 in.
10 in.	±0.050 in.
12 in.	±0.060 in.

wood and water

Are the dimensions of a wood pattern effected by the moisture content of the surrounding atmosphere?

Wood will always attempt to adjust its moisture content so as to be the same as the surrounding atmosphere. If in doing so it gives off moisture it will shrink and if it absorbs moisture it will swell. To minimize these changes it is recommended that patterns be stored in a room held at constant temperature and humidity. The difficulty of doing this has been a factor in bringing about the use of metal and plastics for patterns.

density standards

Do "Density Standards" exist for gray iron and malleable iron?

There are no "Density Standards" for these materials since their density depends on chemical composition and the form assumed by the carbon. The density of these two iron-base alloy systems decreases with increasing carbon, silicon, and manganese. As the carbon in the form of graphite increases the density also decreases.

cement-bonded sands

Is it possible to reclaim cement-bonded sands?

Cement-bonded sands may be cleaned by any process utilizing abrasion. Some plants break down the lumps with a hammer-mill type of crusher. Others use mulling, ball milling, or tumbling to granulate the material and rub the cement free from the surface of the sand. Equipment is also manufactured which dry scrubs the sand particles by pneumatically blasting them against a hard surface. After cleaning, the cement and other fines must be removed by sieving or air separation. The decision to reclaim cement bonded sands is usually a matter of economics, depending on the cost of new sand versus the cost of reclaiming.

obituaries

Joseph D. Walsh, 64, works manager of the Scullin Steel Co., St. Louis, died October 25. He had been associated with Scullin Steel Co. for fifty years.

Nellie Reed Kennedy, widow of Robert E. Kennedy, died November 26 at Westville, Indiana. Mrs. Kennedy was well known in the industry and the American Foundrymen's Society as well as the Chicago Chapter of AFS, in which her husband was a prominent figure for over thirty-four years. The family has requested that any remembrance be in the form of a donation to the Robert E. Kennedy Scholarship Fund, Chicago Chapter of AFS.

John E. Poorman, 85, president of J. E. Poorman, Inc., passed away October 3.

William B. Straub, president of Straub Manufacturing Company and former president of Empire Foundry Company, Oakland, Calif., died November 17.

A native of Marion, Ohio, Mr. Straub lived in the Eastbay area for more than fifty years.

H. Wesley Stokes, 51, treasurer of the Kilbourn Pattern Co., Inc., Milwaukee, died of a heart attack November 23.

A native of Canada, Mr. Stokes was with Northwestern Engineering Co., Green Bay for 18 years, and pattern superintendent at the Waukesha Foundry Co. before his affiliation with Kilbourn Pattern Co. He was a member of a technical committee in the American Foundrymen's Society and was past master of Roosevelt Masonic lodge at Green Bay.

It's easy to obtain product data with the postage-free Reader Service Cards provided on pages 7-8. Use them for information on advertised products, too. Just circle the key number appearing at bottom of the ad.

foundry facts

Maintenance/Air System

■ Proper maintenance of compressors and air distribution systems is essential in modern foundry operations. This six-point maintenance check list has been prepared for MODERN CASTINGS by the Compressed Air and Gas Institute.

Air Distribution And Loss

I **Checking the air distribution system**—Record the air pressures at the main air receiver several times during periods of heavy use. Simultaneously record the pressures at the ends of branches. Pressures at the main air receiver and at the ends of the branches should not differ more than 5 to 7 lbs. Also record the pressure at individual tools when running. Pressure differential between the main air receiver and individual tools should not be more than 10 to 12 lbs. If figures are exceeded, chances are that more production dollars are being wasted than it would cost to revamp the complete air distribution system.

II **Determining air consumption of foundry**—Record during several peak hours the time compressors run at full load and no load. A recording wattmeter or ammeter is of great aid at this point because the time at each condition will be clearly shown.

From this data and the compressor full load ratings (actual delivery, not piston displacement) calculate the air used.

III **Air loss**—Record the compressor load time as before, but do it when no air is being used for work—as during a weekend or even a lunch hour shutdown.

Calculate the output (average use—cfm) as before.

Divide this by the average air use obtained in (II). If this is less than 5 per cent, air consumption is negligible. Between 5 and 10 per cent is good. Corrective maintenance can lower the waste. Over 10 per cent is costly.

Checking For Leaks

IV **Where air is being lost**—Most air leaks are small but the cumulative effect is great. Elimination of leakage requires the following:

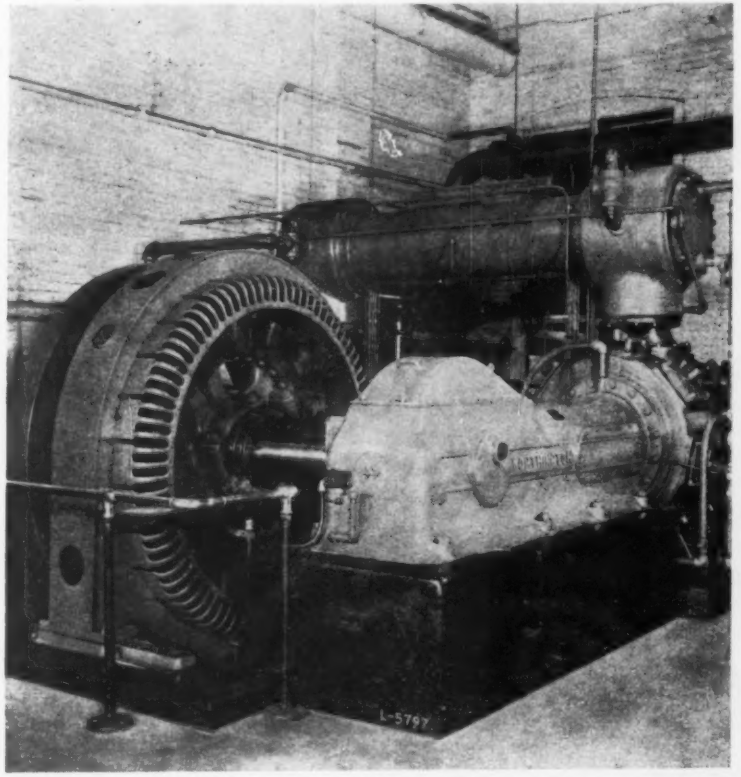
1. Inspect valve stem packing of every valve in the system, repacking when necessary.
2. Replace leaky shut-off valves.
3. Repair leaking valves on tools. Tools should not be left live on the line when not in use.
4. Standardize on good hose clamps. Leaks are frequent when makeshifts are used.
5. Standardize on good blow guns. Homemade types usually leak. Reduced air pressure for blow guns increases safety and saves air.
6. Install condensate separators and drains at branch ends. This eliminates the need for operators blowing lines to clear out water.
7. Use good quality air hose to eliminate breaks.

V **Correcting low pressure**— First step is to eliminate all leakage.

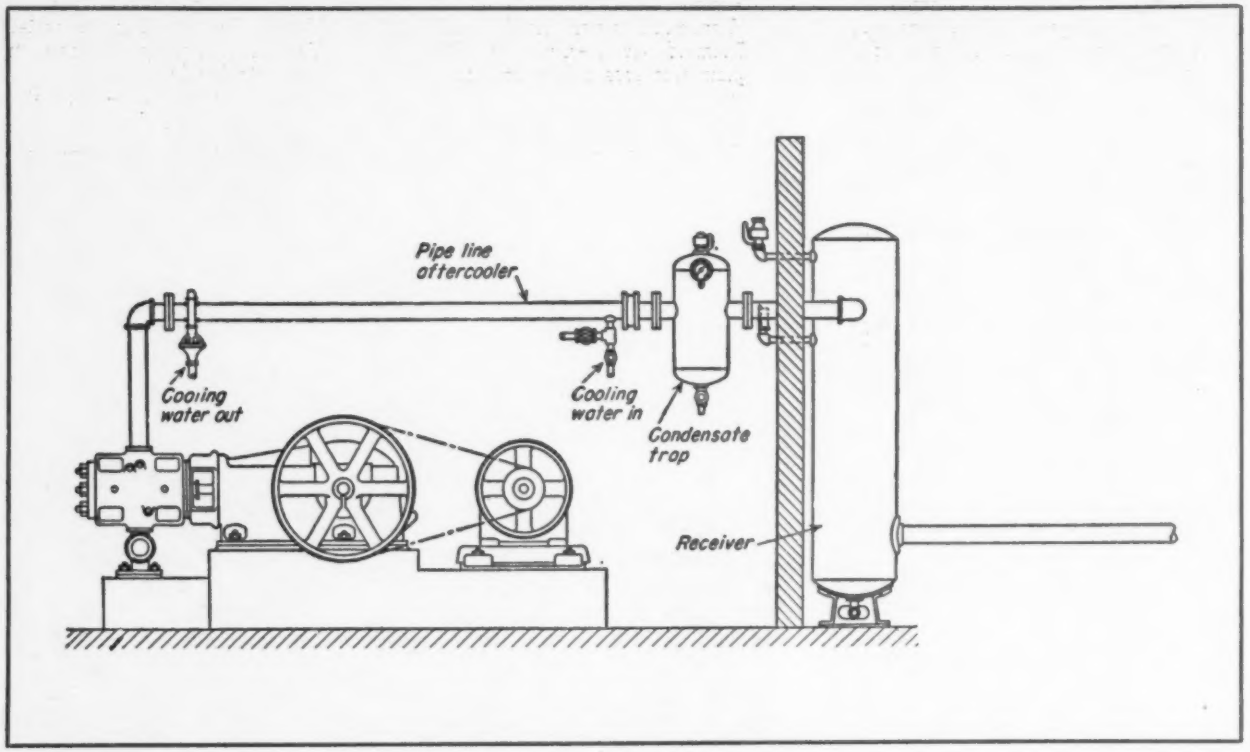
Use the proper size of spuds, nip-

DETERMINATION FOR 2025 CFM COMPRESSOR WITH 5 STEP CLEARANCE CONTROL

Load Point	Time-Min	Cu Ft Air Supplied
Full Load	27	54,675
¾ Load	12	18,225
½ Load	9	9,112
¼ Load	7	3,544
No Load	5	0
Total	60 minutes	85,556 cu ft
Average use—1426 cfm.		



Increasing importance of air system maintenance was demonstrated at the 1956 AFS show, where new air-operated foundry equipment was shown.



Check points for system maintenance may be found in this illustration. Points include: valve packing, hose clamps, air hose, condensate separators and drains, take-off for receiver, and sizing of mains and feed lines.

ples and menders to insure adequate supplies of air to the tools.

Compare main and branch-pressure losses with estimated sectional air usage on a chart of the existing piping layout. This may show obvious restrictions or overloaded feeders which can be quickly corrected. Study probable future growth and plot it on the chart. By analyzing these data it is possible to recognize and make needed changes to bring pressure up to par (90 psi for most tools).

Six Maintenance Guides

VI The six maintenance guides are as follows:

1. Receiver take-off should be from a point considerably above the bottom. Mains should slope in direction of air flow. One inch in ten ft is the minimum pitch to carry condensate to sumps and separators for removal.
2. Main lines should be sized for average air flow with very moderate pressure losses – probably not over 3 psi and preferably less.
3. Branch mains are sized on maximum – not average – flow. This may be 150 to 175 per cent of average flow depending on the number of outlets in use at any one time. Pressure loss in branches, as in mains, should not exceed 3 psi and should be less.
4. Feed lines from branch mains to operating floor and to those connections for tools are sized on the maximum requirements of as many connected tools (from one up) that may be operating at one time.
5. Hose should be sized for not over 5 psi pressure drop with tool at full power.
6. Hose should be no longer than necessary to give the worker required freedom of movement. Where long hose runs are necessary, use a large hose plus a short lighter hose as a whip at the tool.

To keep your system in good shape, do the following:

a. Rerun air leakage tests occasionally.
b. Make random checks of air pressures at various tools in operation.
c. Check automatic traps at regular intervals.
d. Repair or scrap damaged hose.
e. Keep strainers empty and lubricators filled.
f. When new tools are added, recheck lines for ability to carry the added load.

afs chapter meetings

JANUARY

3 . . Canton District . . Mergus Restaurant, Canton, Ohio. Elmer Braum, Central Foundry Div. General Motors Corp., *"To Meet the Challenge."* Management Night.

3 . . Saginaw Valley . . Fischer's Hotel, Frankenmuth, Mich. T. Barlow, Eastern Clay Products Div., *"High Pressure Molding."*

4 . . Corn Belt . . Gorat Steak House, Omaha, Nebr. O. C. Bueg, Arrow Pattern and Engrg. Co., *"Patterns."*

4 . . Western New York . . Sheraton Hotel, Buffalo, N. Y. E. M. Uebel, Development & Research Dept., International Nickel Co., *"Ductile Cast Iron."*

7 . . Chicago . . Chicago Bar Assn., Chicago. A. L. Boegehold, Research Staff, General Motors Corp., *"Materials in the Automobile of the Future."*

7 . .Central Illinois . . American Legion Hall, Peoria, Ill. C. E. Drury, Central Foundry Div., Saginaw Malleable Iron Plant, General Motors Corp., *"Gating to Control Pouring Rate and Its Effect on the Casting."*

7 . . Central Indiana . . Athenaeum Turners, Indianapolis. T. E. Barlow, International Minerals & Chemical Corp., *"Getting the Most Out of Green Sand."*

7 . . Metropolitan . . Essex House, Newark, N. J. Martin C. Ehrman, Jr., International Harvester Co., *"The New Epoxy Resins and Their Application to the Foundry Industry."*

8 . . No. Ill.-So. Wis. . . Lafayette Hotel, Rockford, Ill. F. R. Snyder, Hickman, Williams & Co., *"Cupola Operation."*

8 . . Rochester . . Seneca Hotel, Rochester, N. Y. E. Braun, General Motors Corp., *"The Future of the Foundry Industry."*

8 . . Twin City . . The Covered Wagon, Minneapolis. H. F. Randolph, Mexico Refractories Co., *"Foundry Refractories."*

9 . . Toledo . . Heather Downs Country Club, Toledo, Ohio. Tom Egan, Cooper-Bessemer Corp., *"Nodular Iron."*

10 . . Northeastern Ohio . . Tudor Arms Hotel, Cleveland. C. Schuerman, Foundry Sand Consultant, *"Sand and Its Properties."*

10 . . St. Louis . . York Hotel, St. Louis. John Kura, Batelle Memorial Institute, *"Gating."* Movie of Water Mold Gating.

11 . . Chesapeake . . Hotel Nansemond,

Norfolk, Va. J. E. Reedy, The Delhi Foundry Sand Co., *"The CO_2 Core Process."*

11 . . Eastern Canada . . Sheraton-Mount Royal Hotel, Montreal. W. Dawson, Ford Motor Co., *"Water Cooled Hot Blast Cupolas."*

11 . . Mid-South . . Hotel Claridge, Memphis, Tenn. William Bell, R. Lavin & Sons, *"Essentials Required to Make Good Castings."*

11 . . Philadelphia . . Engineers' Club, Philadelphia. Casting symposium to be held before meeting. C. A. Sanders, American Colloid Co., *"Casting Finish, Precision and Tolerance."*

11 . . So. California . . Roger Young Aud., Los Angeles. Michael Bock II, Exomet, Inc., *"Exothermic Materials."*

14 . . Central Ohio . . Seneca Hotel, Columbus, Ohio. Warner Bishop, Archer-Daniels-Midland Co., *"Common Sense in the Coreroom."*

14 . . Michiana . . Club Normandy, Mishawaka, Ind. J. A. Gitzen, Delta Oil Co., *"Core and Mold Sand Additives."*

16 . . Central Michigan . . Hart Hotel, Battle Creek, Mich. Youth Encouragement Night.

16 . . Oregon . . Heathman Hotel, Portland, Ore. Michael Bock, Exomet Corp., Conneaut, Ohio, *"Aluminum, Risering, Feeding, Degassing & Grain Refining."*

17 . . Detroit . . Tuller Hotel, Detroit. Audience Participation, Casting Clinic for Gray Iron, Aluminum, Brass and Steel.

18 . . Tri-State . . Alvin Hotel, Tulsa, Okla. Don E. Wyman, sales mgr., Exomet, Inc., *"Exothermic and Insulating Materials."*

18 . . Wisconsin . . Hotel Schroeder, Milwaukee. W. H. Johnson, Batelle Institute, *"Gating Research."* (Illustrated.)

18 . . Ontario . . Royal York Hotel, Toronto. Herbert J. Weber, director of safety, hygiene, and air pollution control, American Foundrymen's Society, *"Making the Foundry a Better Place to Work."*

18 . . Birmingham District . . Tutwiler Hotel, Birmingham, Ala. J. H. Smith, Central Foundry Div., General Motors Corp., *"Future of the Foundry Industry."*

18 . . Texas . . Statler Hilton Hotel, Dallas, Tex. M. E. Brooks, foundry engr., The Dow Chemical Co., *"Magnesium Foundry Practice."*

21 . . Utah . . Deseret Inn, Salt Lake City. *Installation meeting.*

21 . . Pittsburgh . . Webster Hall Hotel, Pittsburgh, Pa.

21 . . Quad-City . . Hotel Ft. Armstrong, Rock Island, Ill. James McConville and Andy Fischels, John Deere Waterloo Works, *"Operation and Maintenance of Water Cooled Cupolas."*

25 . . Tennessee . . Hotel Patten, Chattanooga, Tenn. Harry E. Gravlin, Jr., Claude B. Schneible Co., *"Times Do Change."*

FEBRUARY

1 . . Western New York . . Sheraton Hotel, Buffalo, N. Y. Philip Savage, asst. works mgr., McCallum Bronze Co.; Laran Wright, melting supt., Symington Gould Corp.; Harry Ahl, tech. director, Samuel Greenfield Co.; Ezra Katzin, fdy. supt., Pratt & Letchworth. Shop Talks, Nonferrous and Steel.

4 . . Central Illinois . . American Legion Hall, Peoria, Ill. Kenneth MacKay Smith, consultant, *"Quality Control in the Foundry."*

4 . . Central Indiana . . Athenaeum Turners, Indianapolis. Herbert J. Weber, director safety, hygiene and air pollution control program, American Foundrymen's Society, *"Safe Foundry Working Conditions."*

4 . . Chicago . . Chicago Bar Assn., Chicago. Round Table Meeting. Gray Iron Div.: H. Wilder, Vanadium Corp. of America, *"Practical Inoculations of Gray Iron;"* Malleable Iron, Steel & Patterns Div.: Robert Frank, Superior Malleable & Steel Foundry Co., *"Design & Application of Malleable Steel Castings;"* Non-Ferrous Div.: Fred Ridell, H. Kramer & Co., *"Non-Ferrous Gating & Risering;"* Maintenance & Engineering Div.; R. Schadt, Cons. & Application Engr.; Westinghouse Electric Co. (Illustrated Talk), *"Electrical Equipment for Foundries."*

4 . . Metropolitan . . Essex House, Newark, N. J. Howard F. Taylor, Massachusetts Institute of Technology, *"Chemistry and Mechanics of Molding Materials."*

6 . . Toledo . . Heather Downs Country Club, Toledo, Ohio. C. W. Vokac, Hydro Arc Furnace Div., Whiting Corp., *"Electric Arc Furnaces in Iron and Steel Foundries."*

7 . . Canton District . . Barberton Elks Club, Barberton, O. J. G. Kura, Batelle Institute, *"Effect of Gating Practice."*

8 . .Corn Belt . . Fireside Restaurant, Omaha, Nebr. *"Quality Control."*

8 . . Eastern Canada . . Sheraton Mount Royal Hotel, Montreal, Quebec. T. E. Barlow, sales mgr., Eastern Clay Products, *"High Pressure Molding."*

8 . . Mid-South . . Claridge Hotel, Memphis, Tenn. Management from Mid-South Foundries, *"Know Your Area Foundries."*

8 . . Philadelphia . . Engineer's Club, Philadelphia. *"Developments in the Foundry Industry."*

8 . . So. California . . Art Clark, Ford Motor Co., *"Core Blowing."*

9 . . Saginaw Valley . . Bancroft Hotel, Saginaw, Mich. Annual Ladies' Night Dinner Dance.

11 . . Central Ohio . . Seneca Hotel, Columbus, Ohio. Harry H. Kessler, mgr. fdy. operations, Sorbo-Mat Process Engineers, *"Gating and Risering."*

11 . . Michiana . . Club Normandy, Mishawaka, Ind. Harry E. Gravlin, Jr., vice president & gen. mgr., Claude B. B. Schneible Co., *"Dust & Fume Control With An Eye To The Future."*

11 . . Rochester . . Joint meeting with A.S.M.

12 . . Twin City . . To be replaced by the Educational Program which convenes at the University of Minnesota.

12 . . Lafayette Hotel, Rockford, Ill. C. V. Nass, Beardsley & Piper Div., Pettibone-Mulliken Corp., *"Mechanization for the Small Foundry."*

14 . . St. Louis . . York Hotel, St. Louis. O. J. Myers, Archer-Daniels-Midland Co., *"Which Process."*

14 . . Northeastern Ohio . . Tudor Arms Hotel, Cleveland. Howard H. Wilder, Vanadium Corp. of America, *"Practical Cupola Operation."*

14-15 . . Wisconsin . . Hotel Schroeder, Milwaukee, Wis. Twentieth Annual Regional Foundry Conference, sponsored by the Wisconsin Chapter of American Foundrymen's Society and University of Wisconsin.

15 . . Tennessee . . Hotel Patten, Chattanooga, Tenn. William Dawson, Ford Motor Co., *"Water Cooled Cupolas."*

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Reply in confidence stating age, experience, and salary requirements.

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ASSISTANT FOUNDRY MANAGER. Expanding Eastern foundry with modern management perspectives has immediate need for an individual who possesses the following qualifications: Under 45 years of age, college degree in metallurgical, mechanical or chemical engineering or equivalent practical experience in foundry. Familiar with all phases of Gray Iron manufacture including Core Room, Cupola, Sand preparation, molding and cleaning practice. We feel we have a wonderful opportunity to offer an individual who would enjoy putting his ideas into practice in a plant enjoying good union relations. Our avenues for improvement are many and the trait of aggressiveness will be appreciated. Write in confidence to **Box D17, MODERN CASTINGS, Golf and Wolf Roads, Des Plaines, Ill.**, giving complete resume including availability and salary requirements.

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OBERDORFER FOUNDRIES, INC.
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METALLURGIST—Responsible for the direction of two cupolas in a large gray iron foundry located in Buffalo, New York. Degree in Metallurgy preferred, but will consider an applicant with good experience. Send resume, including age, education, experience and salary desired to **Box D11, MODERN CASTINGS, Golf & Wolf Roads, Des Plaines.**

FOUNDRY FOREMAN for Northern Ohio gray iron foundry employing 45 men on jobbing work. Opportunity for ambitious young man to supervise molding and coremaking. Send complete resume including age, weight, height, experience, salary desired, references, etc. **Box C193, MODERN CASTINGS, Golf and Wolf Roads, Des Plaines, Ill.**

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MAINTENANCE ENGINEER for Northern Ohio iron and steel foundry employing 200 men. Jobbing foundry. Familiar with furnace, Morgan cranes, plant layout and production. Send complete resume including age, weight, height, experience, salary desired, references, etc. **Box C200, MODERN CASTINGS, Golf and Wolf Roads, Des Plaines, Ill.**

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Seattle 4

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Spokane

Wisconsin—Interstate Supply & Equipment Co.
Milwaukee 4

Canada—Canadian Foundry Supplies & Equipment, Ltd.
Montreal, Quebec (Main Office) and Toronto, Ont.

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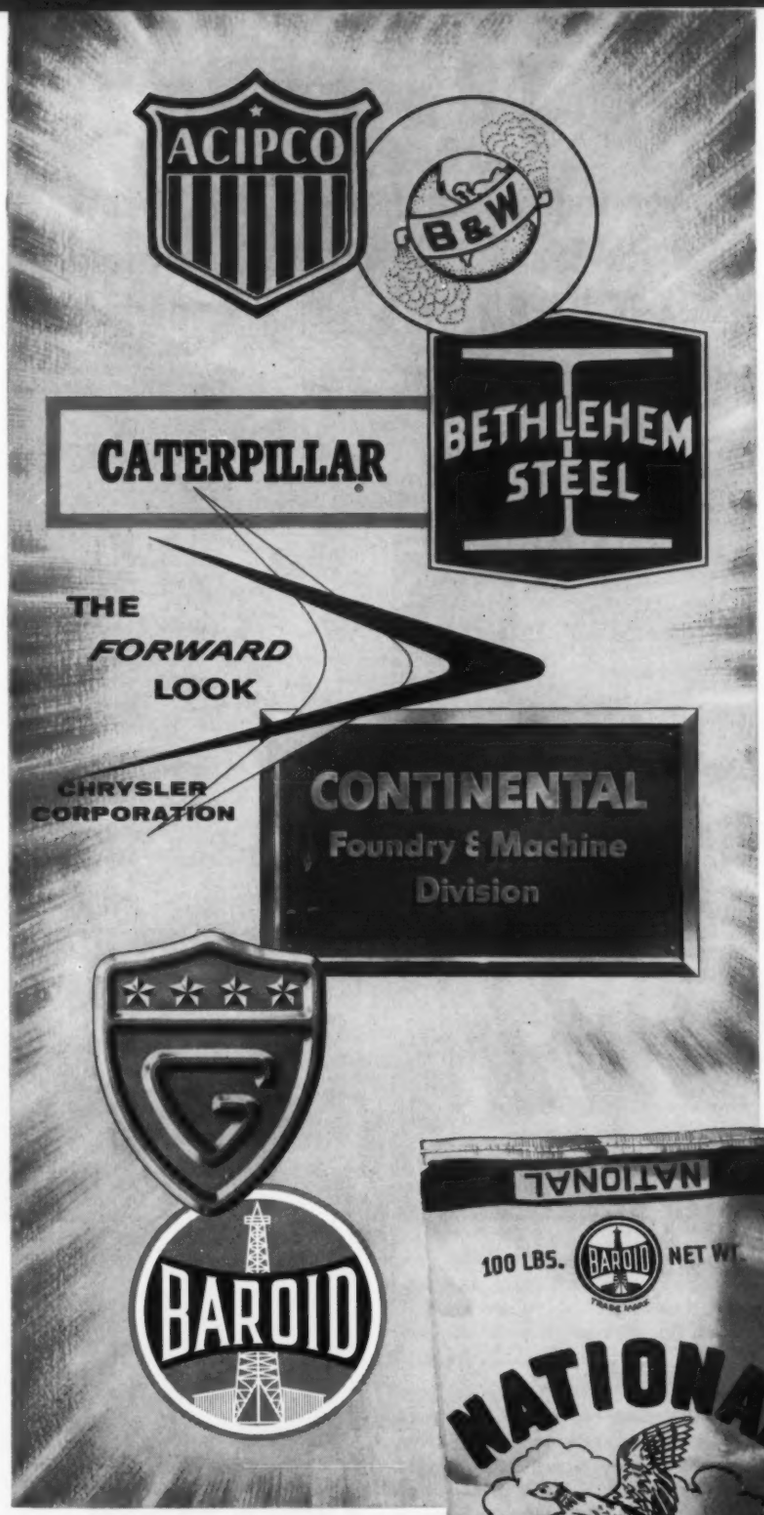

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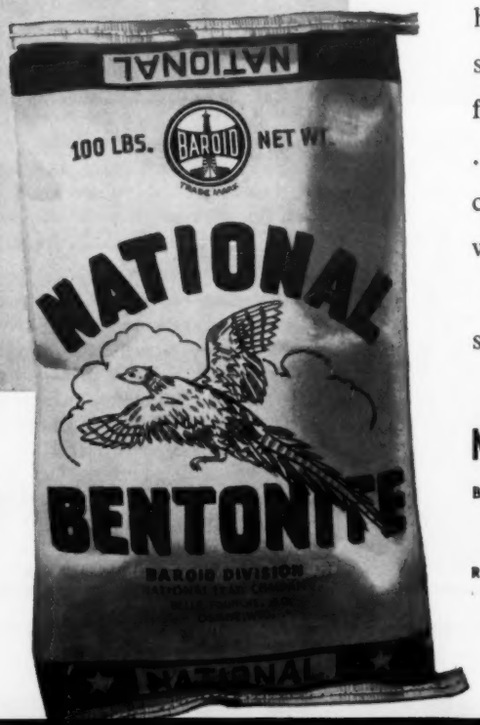

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advertisers and their agencies

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This index is published as a convenience to the readers. While every care is taken to make it accurate MODERN CASTINGS assumes no responsibility for errors or omissions.

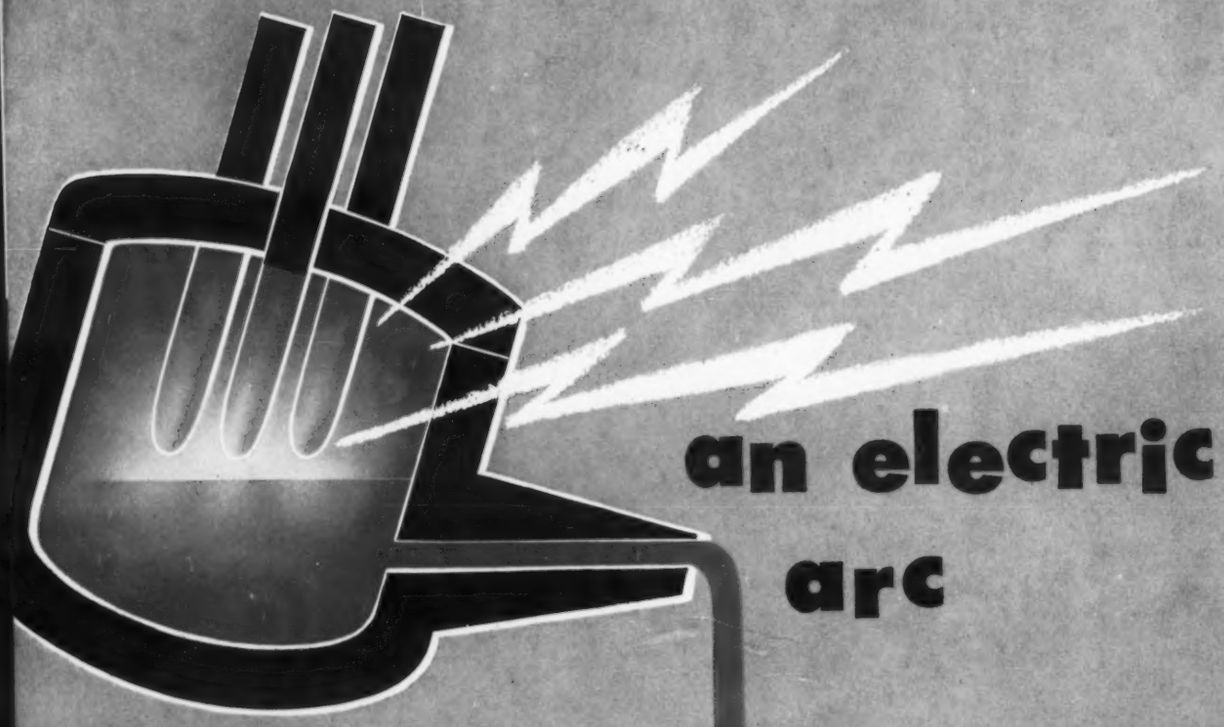
Greenlee Heads GIFS Group

Officers for the Gray Iron Founders' Society's Chicago area management group were elected Nov. 20. Officers are: president, W. G. Greenlee, Greenlee Foundries, Inc.; vice-chairman, W. P. Wright, Hansell Elcock Co.; and secretary, C. V. Adams, Vulcan Iron Works.

At this quarterly meeting R. W. Schroeder, associate professor, foundry and pattern laboratories, University of Illinois, Navy Pier Branch, Chicago, discussed Foundry Education Foundation at Navy Pier.

Dr. Robert F. Pearse, executive vice-president, Worthington Associates, industrial analysis firm, discussed personality characteristics and their relationship to job qualifications.

MORE FACTS on all products, literature, and services shown in the advertisements and listed in Products & Processes and in For the Asking can be obtained by using the handy Reader Service cards, pages 7-8.



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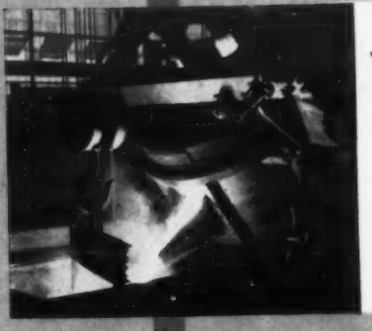

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Many hints and suggestions for economical electric arc furnace operation are contained in "Facts on Duplexing" (FO-4), "The Electric Furnace in The Iron Foundry" (FO-6), "The Whiting Hydro-Arc Furnace Control" (FO-10). Send for the copy or copies you need right now! Specify by "FO" number.

modern castings

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